FOOD MANUFACTURE

Incorporating Food Industries Weekly

HARD HILL LIMITED, 37, STRATFORD PLACE, LONDON, W.1 OCTOBER 1, 1949

T'S A GOOD MOVE..

Yes, it's a good move, and likely to pay big dividends in increased sales if you pack your products in Mono Containers. Safe, simple and hygienic Mono Containers can be attractively printed in any design or colouring. Samples and details available on request. Why not decide now . . .

... TO PUT YOUR PRODUCT IN

MONO

Containers

CARAMEL *for colour*

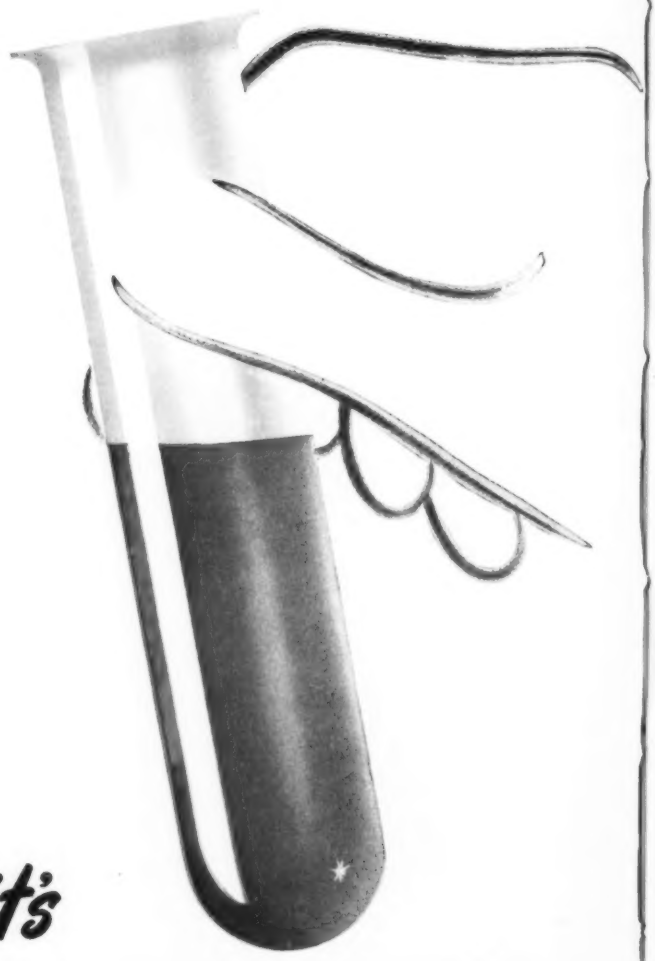
SAUCES

SOUPS

BISCUITS

CAKES

GRAVY



it's CLEAR-it's

CLARK'S

SOLE WORLD DISTRIBUTORS

G. HAVINDEN LIMITED

71 BAKER STREET LONDON W.1 · WELBECK 2814

SOUTH AFRICA: G. HAVINDEN (PTY) LTD. · P.O. BOX 2553 DURBAN

FOOD MANUFACTURE

Vol. XXIV. No. 10 · Published Monthly · October 1, 1949

CONTENTS

	Page
Editorial	433
Quick Freezing in Northern Ireland	437
Chemical and Bacteriological Factors in Fish Spoilage	440
U.S. Market for British Food Products	441
Beet Sugar Treatment	445
Candied Fruits. *C. Trevor Williams*	446
Standards for Processed Cheese	450
Present-day Trends in Food Packaging. *Frank England*	453
Bread Softeners and the Meat Packing Industry	455
Detection and Measurement of Foodstuff Spoilage. Part 2. *R. W. Moncrieff, B.Sc., F.T.I., F.R.I.C.*	456
Poisoning from Honey. *F. N. Howes, D.Sc.*	459
Surveyors and Purveyors, 1949	462
First National Packaging Exhibition	463
Trade News	466
Information and Advice	479
Recent Patents, Trade Marks, and New Companies	480

Published by Leonard Hill Limited, 17, Stratford Place, London, W.1. Mayfair 7383.
1 year $4; 2 years $6.50; 3 years $8, or equivalent.

Disintegrating Soft and Fibrous Materials—

The difference between the dog shown in the illustration and the

BRITISH REMA **HIGH SPEED DISINTEGRATORS**

is that the dog is a nuisance, whereas the "Rema" disintegrators are popular because they will treat soft, friable, medium hard and fibrous materials, producing from them either granular or medium fine finished material. Air separating or classifying equipment may be fitted if required where a superfine product is needed. For soft materials and batch grinding a special combined pinned disc and beater mill is built and will produce material to 99% through 200 mesh in one pass, without a classifier. For a product up to all through 60 mesh, or 70% through 100 mesh, screens can be fitted to the disintegrator grinding chamber.

★ *Write for full information to—*

BRITISH REMA MANUFACTURING CO. LTD
PROPRIETORS: EDGAR ALLEN & CO. LIMITED
IMPERIAL STEEL WORKS
SHEFFIELD·9

for FOOD STORAGE AND TRANSPORT

THIS USEFUL FOLDER (66-R)

contains details of several instruments for measuring TEMPERATURE in Food Stores, and GAS ANALYSERS for the gas storage, on land or on board ship, including:

ELECTRICAL THERMOMETERS
MERCURY-IN-STEEL THERMOMETERS
(Indicating and Recording)
DIAL THERMOMETERS
CO_2 & OXYGEN RECORDERS & INDICATORS

A table giving the most effective storage conditions for various food products is reproduced. May we send you a copy?

CAMBRIDGE INSTRUMENT COMPANY LIMITED
13 GROSVENOR PLACE LONDON S.W.1

FOOD MANUFACTURE

Vol. XXIV, No. 10 October 1, 1949

Panorama of World Food

THE world food and population problem has been discussed in these columns more than once since the war. The sheer brilliance of Sir John Russell's Presidential Address to the British Association this year makes it necessary for us to return once again to this mighty topic—and with a difference—for this time it is the case for hope and optimism that has been presented.

There may have been some who have wondered whether Sir John's well-known optimism on this matter has not been tinged with complacency; he has taken this major opportunity to show that there is quite as much realism in cheerfulness as in Malthusian gloom.

No one man has yet surveyed the many ways in which modern science can increase food production with such brilliant comprehensiveness. Nor did Sir John confine his panoramic view to Europe; his vision of scientific expansion covered the soils and climates of the world. The past and potential contributions of plant breeders, the development of wet and dry tropical "wastelands" for arable and stock farming, the intensification of cropping in peasant-dominated agricultures, the extension of irrigation, the steady influx of better farm machines, the advances in methods of fighting plant and animal pests and disease organisms, were all presented vividly and realistically as solid grounds for optimism.

There were, too, the newer fields of progress—growth-regulating hormones, ecological concepts of land use, hormonal trace foods for farm cattle, and artificial insemination—fields too new for even rough estimations of their potentialities. Sir John looked all along the front line of agricultural science and everywhere he found evidence of real advance and justification for a firm faith.

Nevertheless, his message could be calamitous if it encouraged complacency. He did not say "it *will* be done," but only that "it *can* be done." The time-lag between new scientific discoveries and their application on an appreciable scale must be minimised. How the world makes use of scientists and their ideas is decided by the world as a whole and not by scientists themselves.

Sir John criticised current tendencies to take good scientists out of their laboratories and put them "into committee rooms, or load them up with so much administrative and other detail that they lack the leisure for 'reaping rich harvest from the mellow soil of quiet thought.'"

He also attacked the easy conception of the world as a "Welfare State" producing food out of a sense of duty. "If more food is needed, more work must be done to earn it."

We can but hope that Sir John Russell's optimism and confidence will be conveyed to the public within their context and not as popular headline digests indicating that a very great scientist has sounded the "all-clear" on the world's food front.

Closing the Dollar Gap

Higher productivity and lower costs were the burden of Mr. Paul Hoffman's recent statement in London on ways and means of closing the dollar gap. Speaking as head of the United States Economic Co-operation Administration, Mr. Hoffman had nothing but praise for Britain's export achievements to date, but he pointed out that the percentage of the United Kingdom's total exports to the United States had actually declined from a little over 6 per cent. in the immediate pre-war years to about 4 per cent. in 1948.

These percentages give additional point to his statement that British manufacturers have not as yet begun to tap the huge reservoirs of American buying power. Recommendations, some new, some familiar, were propounded—increased productivity, vigorous and skilful merchandising, and study of the American consumer. If, said Mr. Hoffman, the American consumer could be induced to spend just 1 per cent. more of his total expenditure on British exports, the dollar gap would be closed.

To achieve an increase in her dollar exports from $600 million to $1,800 million, as suggested by Mr. Hoffman, Britain would necessarily have to increase at least five times the number of firms engaged in selling to the dollar market.

Elsewhere in this issue will be found an article covering such food products as jams, biscuits, pickles and sauces, and canned foods which, it is suggested, would be suitable for the vast American market, with indications as to packaging methods to be adopted to appeal to the U.S. consumer.

But there are difficulties; perhaps the chief of these are the American tariffs. Although generally reduced during the last decade, in detail those that apply to many of the United Kingdom's best potential exports are still heavy; many regulations, such as the application of the Pure Food Act, can also be onerous.

Since the time of this writing, the devaluation of the pound from $4.03 to $2.80 has entirely changed the pattern of things, but most of the points in Mr. Hoffman's statement still hold. At his recent Press conference, Sir Stafford Cripps said that he felt assured that United States tariffs would not be raised against British and other imports cheapened by devaluation, but that at the moment it was quite impossible to say what was going to happen in terms of trade.

World Meat Production

World meat production in 1948 was slightly less than in 1947 and considerably below the 1934-1938 annual average, according to a report of the United Nations Food and Agriculture Organisation on July 21. European production was only 62 per cent. of the pre-war level, while North American output was 135 per cent. The report showed that prospects for greater meat production this year are good. In Europe, a mild winter resulted in a great saving of livestock feed, and supplies are now more plentiful than at any other time since the war.

In Canada and the United States the supply of concentrate feed per animal is the highest on record. The FAO foresees a general increase in world meat production during the next two or three years. If European countries reach expected levels of output, their production will be near the pre-war level by 1952-1953.

Shipments of meat last year by the eight major exporters—Argentina, New Zealand, Australia, Canada, Uruguay, the United States, Denmark, and Brazil—fell to about 16 per cent. below the 1947 figure and 10 per cent. below the pre-war average. The report points out that a large proportion of trade in meat is conducted through bilateral contracts at negotiated prices; a world price for meat does not exist.

A New Synthetic Vitamin

The preparation of a new synthetic vitamin A, tentatively called A-3, and the potency tests which have been performed on it, were discussed by Dr. H. M. Wuest, Dr. N. Ercoli, Otto Schwarzkopf, H. J. Cahnmann, A. D. Lewis, and J. Swidinsky at a meeting of the American Chemical Society at San Francisco.

The tests indicated that the synthetic vitamin A has as much growth-promoting activity for young rats as the natural vitamin, and that it is as safe as the natural product inasmuch as it is biologically analogous to it.

During the testing the startling effect on bone growth of massive doses of vitamin A was observed. Fractures of long bones appeared in a few days where the deposition of new bone was unable to keep pace with accelerated absorption of bone for reshaping processes.

Synthetic vitamin A-3 differs from natural vitamin A in its remarkable stability towards acids, and may therefore be useful in pharmaceutical preparations, such as multiple vitamin capsules, where large excesses of vitamin A must now be used to allow for its partial destruction by the strongly acidic constituents of the capsules.

U.S. Grain Production Problems

The management of grain production provides a problem which must be squarely faced by the U.S. Department of Agriculture in the coming years. Overseas demand is falling, but the stocks of most grains are enormous.

For example, the July exports of grain and grain products were approximately $1\frac{1}{4}$ million tons as compared with over $1\frac{1}{2}$ million tons a year earlier. About two-thirds of the $1\frac{1}{4}$ million tons were going to the occupied areas of Germany and Japan. This compares with the proportion going to occupied areas in the whole course of the year ending on June 30, which stood at about 38 per cent. of the total exports of grain. It seems likely, from these and other indications, that commitments in American-occupied countries will soon become her main channel for wheat and maize exports; of these, Japan will probably continue to present the more serious problem.

The Department has in reserve two or three measures that can be invoked if Congress thinks fit to grant the powers. There is a production quota plan that has been inoperative since early in the war. This plan, which is tantamount to the "ever-normal granary" proposal, would aim to provide sufficient for home consumption, an-

ticipated export demand, and normal carry-over stock, without burdening the Administration and the farmer with an unmarketable surplus. The Department is well aware, however, that to make this plan effective it must possess the powers to manipulate a financial incentive of some kind. Its only prospect at present seems to be that it will be given the chance to handle a policy of support prices, which may with luck provide the necessary opportunity for switching production from one channel to another.

If market prices are not to be controlled, and there seems little likelihood that the President will get powers to control prices, some system of support prices has to be envisaged. Mr. Truman stressed the urgency of the matter in his message of July 11 last. It may be supposed that in the coming months the question of the level at which the grain production of the U.S.A. should be maintained will have to be faced by Congress. If no world plan for building up a reserve stock is acceptable to the exporting nations, then clearly the problem becomes a domestic one for the U.S.A. alone. Yet there are those among us who would be loth to see all this productive capacity suspended before we are sure we are out of the wood.

Agriculture on a World Basis

As Sir John Russell puts it in his introduction to the first issue of *World Crops*, a new journal of the Leonard Hill Group, it appears appropriately at a time when a great revolution is taking place in world agriculture.

The contents of this first issue include articles on the world rice situation, on oil palms, on the Overseas Food Corporation's scheme for the production of sorghum in Queensland, and on the fight against disease on cocoa plantations, this latter contributed by the editor, Sir Harold Tempany, who is a high authority on crop production in the Colonies.

The first journal to deal with agriculture on a world basis, its function will be to bring news of developments to farmers, planters, development organisations, stockbreeders, foresters, and nurserymen; to those interested in the use of fertilisers; and to manufacturers of agricultural equipment, processors of plant products, and administrative and scientific workers in these fields.

As a means of conveying an overall picture of world agriculture in all its aspects, *World Crops* will be welcomed by technicians in agriculture, food, engineering, and chemistry.

The New Export Guarantees Act

The Export Guarantees Act, 1949, not only incorporates certain provisions of the former Acts now repealed but also introduces new ones, thus going further than the usual consolidated Acts which only re-enact former measures in different forms.

The new Act re-enacts the powers granted the Government under the 1948 Act to give guarantees to traders against possible loss in export trading and through the Export Credits Guarantee Department (under the Board of Trade) information is available as regards foreign firms, type of trade likely to be done, and business possibilities generally. Under the 1949 Act, capital is made available to the Board of Trade to cover these guarantees, this now being (*a*) £500 millions instead of £300 millions by the 1948 Act, and (*b*) £100 millions instead of the £60 millions by the Overseas Guarantees Act, 1939, this being additional to the amount under (*a*).

Guarantees under (*a*) refer to ordinary commercial transactions, the E.C.G.D. only giving guarantees after consultation with an Advisory Council; under (*b*) the Department can act without reference to the Council and in respect of matters which would probably not normally be considered as ordinary business propositions, but as furthering the national interest.

Examples under (*b*) would be guarantees for rendering economic assistance to countries outside the U.K.; where there may be a "fixed price" contract for capital goods requiring a lengthy period of manufacture during which period increases in prices of materials and cost of labour may occur; trade in capital equipment, machinery, or plant being contracts which mean large sums being laid by for long periods. In some cases risks may be divided between schemes (*a*) and (*b*).

Under the new provisions of this Act, the Department is given more power in the administration of the schemes and, speaking broadly, guarantees can now be given for any transaction considered as being in the national interest which will encourage trade with and result in earnings from places outside the U.K. Guarantees apply to all exports whether visible or invisible. Under this head would come trading arrangements with Governments outside the U.K. to further purchases of U.K. and Empire goods.

Guarantees can be given in respect of the execution of works or services outside the U.K., including the provision of labour and materials; the cost of the installation of machinery or plant

and the erection of buildings can be covered, as can the fees of experts and consulting engineers, the cost of training employees abroad, and also the use on a rental basis of a U.K. contractor's own equipment in connexion with the execution of engineering works abroad.

Sales by merchants and sales from stocks abroad come under the schemes, which can also apply to the financing of overseas sales agencies.

Insurance can be effected by U.K. merchants to cover raw materials and primary products produced abroad and shipped from a foreign country to another such country; this applies equally to *entrepôt* trading.

The most comprehensive policy is the E.C.G.D. (Contracts) Policy, which covers practically every description of loss which may occur in export trading, perhaps the most important being insurance against loss through the insolvency of the buyer or through protracted default in payment by the debtor. This policy guarantees 85 per cent. of the contract price in respect of the insolvency with possibilities of further payments in the event of any yield from the debtor's estate.

The rate of premiums varies according to the country of export and the risks involved, but if the turnover insured is of fair amount, on average the premiums would work out at £1 per £100 turnover, or even less.

For capital goods, machinery, and plant, the policies are usually special ones according to the individual circumstances of the particular case, but are based on the standard contracts policy.

It might be of interest to mention that these guarantee schemes have been operating for twenty-eight years, and up to date there has been no charge upon the Exchequer.

Pectinase Study

In the recently published report of the Director of Food Investigation, D.S.I.R., for the year 1947, mention is made of the attention which has been given to ways of producing active preparations of pectinase. Bran cultures, which can be subsequently dried and kept in stable form, yield extracts which though active are often dark in colour and possess a mouldy smell. Moreover, these extracts contain spores and fine particles of bran which are difficult to remove. Treatment with solvents such as chloroform, ether, alcohol, etc., may remove much of the smell and some of the colour from dried bran preparations without seriously reducing their activity. Much of the spore material and the finer particles of bran can also be removed by agitation in these solvents. Pectinase production by fungi growing in liquid culture has been found not to depend upon the presence of pectin, but it appears to be essential that the medium should not become unduly acid, as it tends to do by the growth of the fungus in it unless suitable buffers are present.

Active culture solutions or active extracts from bran cultures can be appreciably concentrated without loss of activity by freeze concentration or by evaporation at 37° C. (98·6° F.), but drying, either alone or on a carrier, at high or low temperatures leads to some loss of activity. The extent to which the enzyme is precipitated by addition of alcohol is greatly influenced by the presence of salts, and no method of recovering the major proportion of the enzyme by precipitation from concentrated solutions has so far been discovered.

Old Moore Up-to-date

Primarily based on measuring a Universal Natural Law which seems to control human and fish psychology, the basic premise of the research efforts of America's Andersen Laboratories, under the guidance of Frank A. Anderson, is that social, economic, and political trends are all part of a universal master pattern over which man has no control, acting merely as a cog in a great evolutionary scheme of things.

In order to measure the cosmic force which affects man as well as fish, the right ascension positions of the moon are measured and correlated with past events which express themselves psychologically as either a plus or minus value or effect.

To determine what lies ahead future right ascension positions of the moon are matched with positions in the past, and it has been found that when the moon approximates or comes into exact position with one that has occurred in the past, the psychological plus or minus repeats itself.

Boiled down to a more general level, it seems that by reference to some 138,000 equations the Laboratories are able to say when fish will or will not be caught. Neither are the forecasts confined to the fishing industry; claims to have predicted accurately in such diverse fields as human relations, stock market collapses, and accidents have also been made.

Several U.S. publications have made mention of these "peeps into the future," and we feel rather inclined towards reiterating the question put by the *Washington Memo*: "If he knows so much, why does he have to work for a living?"

Quick Freezing in Northern Ireland

Established in Northern Ireland in 1930 to process efficiently, to pack attractively, and to distribute economically throughout the United Kingdom and abroad the produce and livestock products from Ulster farms, the Newforge group of food processing factories has included in its development programme all the latest methods in curing, canning, chilling, dehydration, and quick freezing.

STEADY progress in quick freezing has been made by Newforge since the installation of their first cabinets in 1941. This progress has been due, in no small measure, to the painstaking research made by the company's executives in connexion with raw materials, processing methods, storage, and distribution.

Prior to the introduction of quick freezing, visits were made to the United States by principal executives whose findings are now reflected in the technical processes and methods employed by the company.

The quality of raw material, the range of the distributive field, and the maintenance of quality after freezing are the three guiding principles of the company's quick freezing division which was set up in 1941 and charged with working to full capacity on meats and poultry, supplemented by fruits and vegetables.

The development of quick freezing by the company has provided a new stimulus to Ulster fruit and vegetable growers to cultivate their small farms; the agricultural division has contracted with these growers for the receipt of stipulated quantities of fruits and vegetables.

Fruit Processing

An experienced team of girl operatives carries out hand grading of the fruit, which is supervised by the factory quality control staff. As aids to identification, coloured wall diagrams are placed near the grading tables, portraying what constitutes a quality fruit and also illustrating methods of grading.

After grading the next step in fruit processing is filling, the fruit being filled into composite containers by Syntron feeders; syrup is added by automatic fillers. Automatic machines clinch the lids of the cartons at a speed of thirty per minute prior to the quick freezing operation.

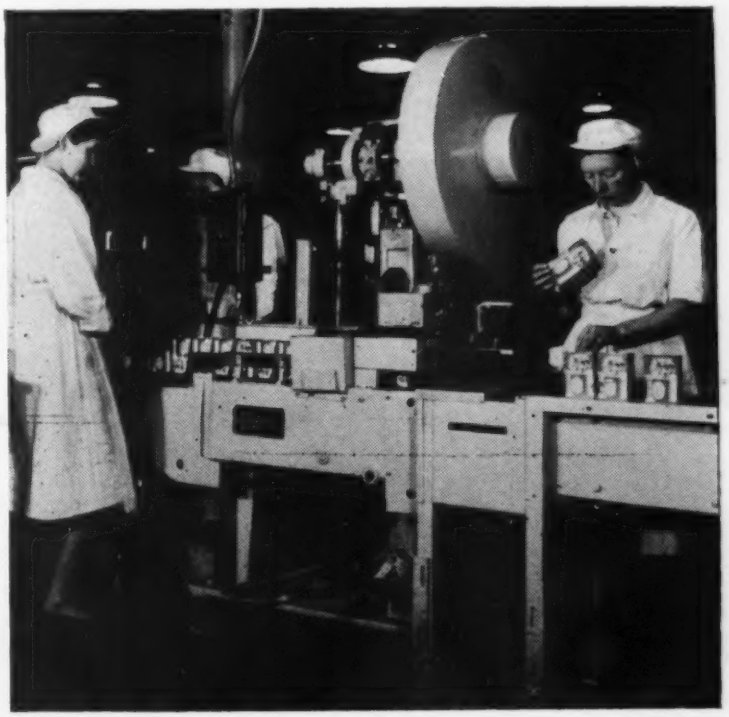
All quick freezing is carried out at −40° F., retail packs requiring approximately two hours' and larger packs about three hours' processing. Packs containing liquid are processed for a slightly longer time.

Quick Frozen Vegetables

Present market conditions have limited the choice of vegetables for quick freezing to broad beans and sliced french beans.

In the case of broad beans, podding is effected on the farms by a converted I.M.C. pea podder; all washing, grading, and inspection are also confined to the vicinity of the farms.

Water blanching is carried out at the factory, the treatment lasting approximately three minutes



Flats are unpacked and clinched at one end before being conveyed to the fillers.

Cartons travel along the conveyor belt for filling and weighing.

at 210° F., followed by cooling through a rod washer.

Inspection of the blanched beans on the travelling belt is carried out under the supervision of the factory quality control staff.

Filling into composite containers, clinching, and freezing follow the same routine as for the fruit.

Topping and tailing of sliced french beans is carried out by hand. The beans are then washed, graded, inspected, steam blanched, and sliced automatically. Filling, clinching, and freezing operations are as for fruit.

Freezing time for the french beans is two hours at −40° F.

Meat and Poultry Processing

All ox tripe and other offal from Northern Ireland abattoirs are processed and quick frozen under Government control. In addition, considerable quantities of Grade A meat are quick frozen and supplied to the Admiralty for use where refrigeration storage space is limited and supplies of fresh meat are difficult to procure.

Poussins, approximately 1½ lb. in weight, are killed at the factory, hung, plucked by a wet process of scalding water, and dried. The prepared poussins are then drawn, trussed, and finally stored on trays in the factory chill room at a temperature of 34° F. for three days to mature.

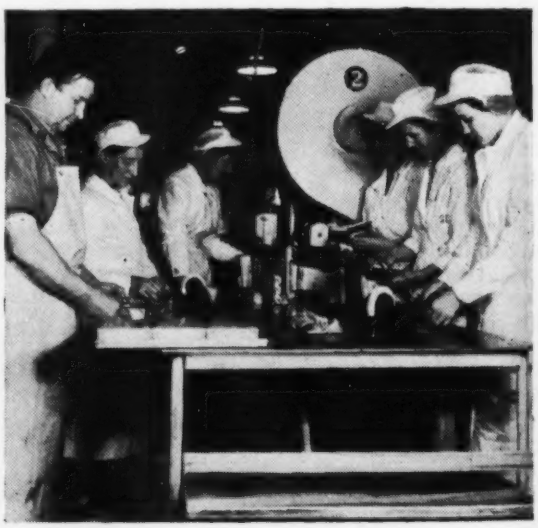
After frying in deep fat for approximately fifteen minutes, the poussins are split in half. The two halves are hand packed in a waxed carton with Cellophane inside liner, the weight being made up with stuffing and sauce.

Quick freezing takes approximately two hours at a temperature of −40° F. After removal from the freezer, the packs are hand labelled or wrapped with Cellophane overwrap, packed in outer cases, and stored at a temperature of −10° F. prior to shipping.

Distribution and Storage

Following quick freezing and packing in outer cases, all products are placed in the factory's cold store. As the company's quick frozen products

Following the addition of syrup, the cartons are checked for weight.



After final clinching and inspection, cartons are stacked on trays prior to freezing.

The trays, filled with cartons, are loaded into the froster for quick freezing.

The quick frozen products are packed into outer cases and removed to the cold store.

are produced mainly during the summer months, suitable storage accommodation is required pending distribution in the winter months.

With a holding capacity of 175 tons, the store is kept at a below zero temperature. Defrosting is effected by hot ammonia from the compressors which melts the snow on the pipes; this maintains their cooling efficiency. A warning bell rings should the entrance door not be correctly closed.

The floors are laid on 8 in. of compressed cork, and the whole building is formed round a cork envelope which prevents the ingress of external heat.

Transport to the English distributing company is provided by refrigerated cross-channel ships. On arrival, the products are first stored in London, Liverpool, and Manchester prior to distribution in insulated vans and containers to hospitals, hotels, and wholesale and retail stores.

Packaging Trends

The present trend in packaging is towards standardisation. Two types of retail cartons are used for first and second grades, and there is one institutional size carton for all 4 lb. and 5 lb. packs. The company have adopted a standard design in six colours for all packs, retail and institutional, depicting a selection of fruit, vegetables, meat, fish, and poultry frozen into ice blocks with a panel left blank for the title of the variety.

Standardisation was introduced to achieve immunity against market fluctuations; should a particular vegetable crop fail, there would be no corresponding surplus of cartons. It is also a considerable aid to storage and processing.

All product titles are on rolls of adhesive Cellophane. One roll carries 1,000 titles—in other words, it is equal to the same number of cartons. This achieves speed when changing from one product to another, economy due to universal use of

A corner in one of the modern laboratories.

containers, and simplicity of storage and selection of containers.

Fruit, vegetable, and pre-cooked food titles are printed in red, green, and black respectively, providing easy identification for factory operatives and stockists.

Retail packs are in metal-ended composite foil laminated containers, and institutional packs in waxed collapsible cartons.

Future Plans

Much has been done to mechanise further the operations of selection and packaging, but the company consider that the cost of storage must be reduced or it may become a prohibitive barrier to successful marketing.

The rich supply of agricultural produce in Northern Ireland constitutes a source upon which the company can rely for a wide variety of high quality raw material. With the removal of controls, which at present restrict buying, processing, and packaging, there is every indication of substantial developments in the sphere of quick freezing.

SUPPLIERS OF EQUIPMENT

Frosters: *Birds Eye.*
Water blancher, rod washer, and french bean slicer: *Mather and Platt.*
Steam blancher: *To the Company's own design.*
Clinching machines and containers: *The Metal Box Co.*
Syntron automatic fillers: *International Combustion Co.*
Wrapping machinery: *E. S. and A. Robinson.*
Institutional cartons: *Pearlite Box Co.*
Adhesive tape: *Industrial Tapes.*
Outer cases: *Thames Board Mills.*

Chemical and Bacteriological Factors in Fish Spoilage

EXPERIMENTS carried out by the Pacific Fisheries Experimental Station to establish more positive criteria of the quality of fresh fish are described in the current Progress Reports of the Fisheries Research Board of Canada.

Flesh spoilage in fresh fish may usually be assessed roughly by means of organoleptic tests (appearance, smell, and taste), but there have been frequent and varied attempts to establish more positive criteria of quality based on bacteriological, chemical, or physical examinations.

One chemical test for spoilage which has shown considerable promise, especially when applied to such fish as cod and haddock, is that which involves the determination of trimethylamine, which is formed by certain bacteria from trimethylamine oxide, occurring in the flesh of most marine fish. Trimethylamine usually increases in amount as the fish undergo bacterial spoilage. The test has not been successful with certain British Columbia marine fish, and no satisfactory explanation of this apparent discrepancy between Atlantic and Pacific coast fish has been given.

Previous work at the Station has shown that acidity is of considerable importance in determining the effectiveness of certain preservative types of substances (*e.g.* nitrites and benzoates) in retarding bacterial spoilage. Experiments were carried out to ascertain the relation of muscle acidity to the rate of increase of bacteria and trimethylamine in fish muscle and to determine whether, under conditions common on the Pacific coast, the trimethylamine value could be employed as a reliable index of spoilage. The effects were found to be very irregular.

While no definite standard relating trimethylamine content to grade of fish has been set, there has been a tentative suggestion that fish with a trimethylamine value below 2 might be considered strictly fresh, while values from 2 to 15 might indicate that the fish is beginning to spoil. Trimethylamine values of 15 to 30 or over would indicate spoiled fish. Anomalies have been found, however. Two samples of fillets which organoleptically were very stale had trimethylamine values between only 2 and 3.

It seems that flesh acidity may, under certain conditions, inhibit trimethylamine formation, but that this depressing effect is not consistent. The conclusion has been arrived at that although flesh acidity may contribute to depression in trimethylamine formation, it is not the only factor at work. It seems remotely possible that the flesh of certain fish contains substances which tend to prevent the formation of trimethylamine by inhibiting the bacterial enzyme, triamineoxidase, responsible for its formation.

Finally, it is stated that, in all instances, although more especially at the higher *p*H values, salmon samples exhibited a marked rancid odour and that the red astacin pigments were badly bleached. There is little doubt that this was due both to action of bacteria on the fats and oxidation of the unsaturated fatty acids. It is certain that development of rancidity is just as important as, or possibly more important than, formation of trimethylamine in causing quality deterioration of fresh fatty fish.

BOOKS RECEIVED

Orders for any of the books listed below or reviewed in this issue may be placed with the Books Department, FOOD MANUFACTURE, *17, Stratford Place, London W.1. It is regretted that under present conditions it is not always possible to supply books by return of post.*

Photoelectric Methods in Clinical Biochemistry. By G. E. Delory, M.Sc., Ph.D. Pp. 90+x. Hilger and Watts. Price 15s. net.

The Jusfrute Book. By G. I. Adcock, V.D., M.S.E. Pp. 166. Jusfrute, Ltd. Price 10s. net.

U.S. Market for British Food Products

Concentrating on such specific commodities as biscuits, confectionery, meat, sauces, pickles and relishes, jams, jellies, and marmalades, canned fish, and non-alcoholic beverages of the so-called soft drink type, a report on the possibility of increasing exports of United Kingdom food specialities to the United States has been compiled from information supplied by H.M. Consulate General, New York.

IT is desired to stress that the markets for foodstuffs and food specialities in the United States are two separate entities. While they may and, in fact, do overlap and intertwine, it should always be remembered that a British food speciality—or perhaps better called delicacy—usually reaches an American palate for much the same reason that British tweed lands on an American back. This point is made because it necessarily influences the market procedure for British food specialities in such salient phases as advertising, distributing, packaging, and pricing.

While it is estimated that Americans spent over 28 billion dollars on foodstuffs in 1947, it is obvious that the vast majority of this sum was spent on domestically produced articles. The negligible quantity of United States imports of food specialities as shown by the latest returns is conclusive evidence that the vast bulk of Americans know nothing of the special qualities of United Kingdom food specialities. Consequently, the market for United Kingdom foodstuffs in the United States is a market for what are looked upon in this country as delicacies.

Despite or because of the above-mentioned condition, there is ample reason to believe that an increased market for United Kingdom food delicacies can be acquired and maintained. Accordingly, the following points are offered as a basic market guide for any United Kingdom firm considering entering this market:

1. The quality of the product must have a special and preferably exclusive appeal. Furthermore, that quality must not under any circumstances be allowed to deteriorate.

2. The product must be packaged in such a way as to attract not only the retail customer but also the retail store which wants merchandise that will move quickly, and which, with very rare exceptions, is not staffed to explain the qualities of the merchandise available.

3. The products must be brought to the notice of the consumer, so that she, in turn, will ask for them in the store or buy them if she sees them. This means continuous advertising and promotion from year to year on a scale which must be surprising to those unfamiliar with United States conditions.

4. A serious and continuing study of the market must be made in order to choose, support, and supervise a competent representative.

5. Price is still of importance and should be kept to a minimum.

The United States is a country with inhabitants deriving often only at second or first generation from every country in the world. It is no exaggeration to say that there is a market in the U.S.A. for every conceivable type of foodstuff. However, the U.S.A. food industry is well aware of this and has geared its production accordingly. Admirable American-made substitutes are available for the widest variety of food specialities from all over the world. Moreover, importers have to pay freight, insurance, and duty. The result is that imports are possible only on a relatively limited scale for specialities which it is either not economical to manufacture in the U.S.A. or which subsist overwhelmingly on the limited public that buys imports for their prestige.

Seasonal Markets

Another characteristic frequently of importance is that the market is often seasonal: *e.g.* plum puddings are sold only for a few weeks before Christmas and perhaps Thanksgiving Day at the end of November; biscuits are too heavy a fare to be generally acceptable in the heat of an American summer. Deliveries must be geared to seasonal requirements as wholesalers and retail stores will not take delivery of out-of-season merchandise.

There are a limited number of retail outlets to which the importer or United Kingdom manufacturer can sell direct, but if he is to cover the bulk of the outlets he must allow for the use of wholesalers and for the increase in cost resulting from their mark-up.

Appointment of Agents

It will be realised that appointment of wholesalers and retailers, advertising, and promotion all have to be closely geared together. It is worse than useless to advertise if supplies are not available. This is a difficult job; it is true that it can be tackled in one wholesale area at a time, but finally many individual areas must be covered to obtain the benefits of the market. It is obvious that this requires a good agent, and one put in a position where he has a real interest in doing the work. Money is not everything, but it is useless to expect good work without seeing that remuneration is equally good.

Importance of Packaging

Packaging is, without question, one of the most important considerations in the marketing of any food item, be it speciality or staple in the American market. Over half the independent and 80 per cent. of all chain stores in the U.S.A. are self-service stores. Self-service has become so prevalent in American grocery stores that the grocery clerk is no longer expected to attempt to exert any influence on the customers' choice of a product. This task has been delegated first to advertising and secondly (and particularly at the point of sale) to packaging.

The keynote of merchandising in the United States is service to the retailer and to the ultimate consumer. Admittedly the fundamental aims of a package design are:

1. To identify the product.
2. To inform the consumer of its use.
3. To invite the consumer to purchase.

The manner in which these details are taken care of depends on the product, the market, and the consumer. However, in a highly competitive market such as this, it is necessary to offer something more in order to make the product stand out above the other numerous brands that will unquestionably be displayed at the same time.

In most cases the greatest emphasis is placed on the display face of the package, and this is understandable, but the rest of the package should not be neglected. A folding carton, which may average 3 in. wide by 5 in. high by 2 in. thick, has a total area of 60 sq. in., of which perhaps 30 sq. in. are visible at any one time. Thirty sq. in. for five-colour advertising in a leading American periodical would cost about $3,000. On the package the space cost is nothing. Small domestic producers, who cannot possibly be national advertisers, use this package surface as their principal or, in some cases, sole means of advertising.

Legal Requirements for Packaging

The most important consideration from the point of view of a United Kingdom manufacturer is the Food, Drug, and Cosmetic Act as administered by the Food and Drug Administration. This Act is a complex document made further complicated by the multiplicity of rulings and regulations issued under it. The following is a summary of its most important provisions that pertain to food:

1. The labelling of a food must not be false or misleading in any particular.
2. A food must not be offered for sale under the name of another food.
3. The label of a food which is an imitation of another food must bear in type, of uniform size and prominence, the word "imitation" and immediately thereafter the name of the food which is imitated.
4. A food in package form must bear a label containing the name and address of the manufacturer, packer, or distributor.
5. A food in package form must bear a label containing an accurate statement of the quality of the contents in terms of weight, measure, or numerical count. Reasonable variations are permitted and exceptions as to small packages shall be established by regulations.
6. If a food purports to be or is represented as a food for which a definition and a standard of identity have been prescribed by regulations, its label must bear the name of the food specified in the definition and standard, and in so far as may be required by such regulations the common names of optional ingredients (other than spices, flavourings, and colouring) present in such food.
7. If a food purports to be or is represented as a food for which a standard of quality has been prescribed by regulation and its quality falls below such standard, its label must bear, in such manner and form as the regulations specify, the statement that it is below standard.
8. If a food purports to be or is represented as a food for which a standard or standards of fill of container have been prescribed by regulations and it falls below the standard of fill applicable thereto, its label must bear, in such manner and form as the regulations specify, a statement that it falls below standard.
9. A food which does not purport to be one for which a definition and a standard of identity have been prescribed by regulations must bear on its label the common or usual name of the food, if any there be, and in case it is fabricated from two or more ingredients the common or usual name of such ingredients. Spices, flavourings, and colourings other than those sold as such may be designated without naming each. Exceptions may be established by regulations to the extent that naming of the ingredients is impracticable.
10. If a food purports to be for special dietary uses its label must bear information prescribed by regulations concerning its mineral, vitamin, and other dietary properties.
11. If a food contains any artificial flavouring, artificial colouring, or chemical preservatives, it must bear labelling stating that fact. To the extent that compliance with this requirement is impracticable exceptions shall be established by regulations. The requirements with respect to artificial colourings do not apply to butter, cheese, or ice cream.
12. Any word, statement, or other information required by the Act to appear on the label or labelling must be prominently placed thereon with such conspicuousness (as compared with words, statements, designs, or devices in the labelling) and in such terms as to render it likely to be read and understood by the ordinary individual under customer conditions of purchase and use.

It is permissible and it would be advisable for United Kingdom manufacturers to submit sample labels to the Food and Drug Administration for approval before manufacturing any large quantity of labels for export to the United States.

Handicap to Sales

One of the greatest handicaps to the sale of United Kingdom food specialities in the United States is the present practice of marking up such items 33⅓ per cent. to 40 per cent. of the retail price as compared with 20 per cent. to 25 per cent. for similar type domestic items. Retail dealers justify this practice on the grounds that United Kingdom food specialities are slow moving, low volume lines that occupy valuable shelf space.

Consequently they must be marked up higher so that the dealer may obtain the same returns as he would if his shelf were stocked with high volume, rapid turnover merchandise.

The only possible way of changing this attitude would be to increase the turnover rate of United Kingdom goods by creating an increased consumer demand *via* advertising. Thus armed with what is known in the United States as a consumer franchise, importers could argue for a lower margin on United Kingdom goods, and any savings effected in this manner could be applied to the cost of advertising.

Jams, Jellies, and Marmalades

There are five general types of fruit spreads domestically produced:

1. Jams made of fruits and sugar, cooked to an even consistency with fruit pectins added in some cases.
2. Jellies made of strained fruit juices and thickened through cooking with sugar and pectin in the cases of fruits which will not solidify without it.
3. Preserves or fruits preserved to retain original shapes, in sugar and liquid.
4. Marmalade made of fruit pulp and rind, juice, and sugar; citrus fruits are favourites for this type of spread.
5. Fruit butters made from fruits cooked to a smooth paste, with a smaller sugar content than used for jam and with spices added.

Because of their eye appeal, fruit spreads are particularly suited to glass packaging, and this is practically universal in the common size lines (10 oz. to 2 lb. jars are usual).

A nation-wide survey was undertaken recently by the research organisation of the Osens-Illinois Glass Company, and their findings are considered to be the best available yardstick of the industry to date. Some highlights of this report are:

1. Jams and/or preserves (the two are considered in the same category by the American consumer) and jellies are purchased more frequently than are marmalades and fruit butters.
2. Flavour preference tends to be overwhelmingly for one variety, *e.g.* strawberry for jams and preserves and orange for marmalades.

In connexion with flavour findings on marmalade, the sweet type of orange marmalade is preferred by 68·8 per cent. of American users, the tart type by 28·4 per cent., and the bitter type by 3·4 per cent.

Meat Sauces

Catsup is unquestionably the leading sauce used in the United States, with chili sauce and sauces of the Worcestershire and related type following in that order.

Catsup and chili sauces are both tomato products of *purée* consistency with vinegar, spices, and sugar added for seasoning.

The usual base for Worcestershire sauces is soy vinegar, with various combinations of seasoning added. The term is generic and not a trade name. Americans in general tend to classify almost all sauces with a vinegar base as Worcestershire sauce.

Since all sauces for table use ordinarily appear in their original containers, packaging is a point of particular interest. However, most available information applies to catsup bottles which find general disfavour in the eyes of American women. Chief points of criticism include such statistics as:

1. Almost all catsup bottles are too tall and thin with necks that are too narrow for convenient pouring.
2. General dissatisfaction with the wrap-around tin arrangements which some manufacturers still place on top of their bottles.
3. Intense dislike of the present metal cap on most bottles that tends to rust and discolour.

Probably the most important consideration for United Kingdom products is the fact that a shorter bottle is preferred in this market for the following reasons:

1. Better appearance.
2. Greater ease in storing (not too tall for shelf space).
3. Easier pouring because of shorter neck.
4. Less tipping because of heavier base.

Bottled Soft Drinks

Production of the non-alcoholic beverage industry, as defined by the United States Bureau of the Census standards, is divided between carbonated and still beverages. Cereal beverages are chiefly produced outside this industry.

Bottle sizes commonly used are 6, 7, 8, 10, 12, 16, 24, 26, and 32 oz.

The sale of bottled soft drinks is not seasonal in the accepted sense of the word, although a sharp increase is brought about by hot weather, and the "peak season" is during the summer months. The trend, however, is definitely toward a steady all-year-round sale, and merchandising efforts are directed toward levelling out sales curves by intensive development of home consumption.

Confectionery and Candy Bars

About half the national candy output is marketed in an area consisting of eleven contiguous states and the District of Columbia, extending along the eastern seaboard from New York through Virginia, reaching west across Ohio, Michigan, and Indiana, and into Illinois and to Wisconsin. Immediately adjoining this area on the east is the New England territory, with concentrated markets in Massachusetts. Important candy-consuming States touching the western border of this area are Missouri, Minnesota, and Iowa.

The characteristic seasonal pattern of sale by the domestic candy industry shows that the highest activity is reached just before the Christmas holidays, with the market falling off by January. As the year progresses, there is a minor but well-defined rise in sales for Easter. In addition, the manufacturers and retailers experience a pick-up

in sales for the February holidays, particularly in box trade for St. Valentine's Day. The bottom for all candy sales is reached in midsummer almost uniformly in July, with an upswing geared first to Thanksgiving and culminating at Christmas.

An interesting recent development in the retail pattern is the increase in sales of candy in cinemas and theatres, particularly sales of bars and small packages. It is estimated that about 10 per cent. of the output of confectionery of this type is currently being sold in this way.

Canned Fish

In the consumption of fish and fish products the United States lags far behind most of the countries of the world. In 1947 the United States annual *per capita* consumption of fish was 14 lb., as compared with approximately 40 lb. in the United Kingdom and 70 lb. in Norway.

World War II, however, resulted in a tremendous expansion of the United States fishing and fish processing industry as an outgrowth of heavy world demand for protein-rich foods and, in the domestic civilian market, rationing and shortages of meats and meat substitutes.

The United States imports a wide variety of canned fish from many countries. Portuguese sardines are regarded as the best quality, but the bulk of the imported sardines come from Norway. Anchovies are imported from Italy, Portugal, and Spain, salmon from Canada, and caviar and other fish roe from the U.S.S.R. Tuna was imported mainly from Japan before the war, but since then Portugal and Peru have been the principal suppliers. Canada and Cuba are the chief countries supplying canned lobsters to the United States, and Canada also supplies canned clams, whereas before the war they were also imported from Japan.

Some large canners have advertised extensively under their own brand name, and have thus succeeded in establishing national distribution. In general, though, most canners pack for private brands which are sold locally. The Associated Salmon Packers have done considerable co-operative advertising aimed chiefly at spreading consumption seasonally and at moving accumulated stocks when they threatened price breaks.

A co-operative advertising campaign for Norwegian sardines, and an advertising drive to halt drops in consumption, sponsored by the Oyster Institute, are other pre-war examples of promotional efforts of the type currently being carried on, on a large scale, by the Fish Industries Institute.

Pickles and Pickle Relishes

Statistics released by the Pickle Packers' Association on cucumber acreage record that the first year of the war saw a dropping off from 1934-1941 annual acreage of 89,370. This figure rose to 93,000 in 1943, and reached 149,000 in 1946. Heavy yields plus unsettled conditions in the food canning industry generally, resulting from reduction in government buying and other post-war adjustments, caused a cutback for the 1947 season to 136,000 acres.

Consumer demand, however, remained high, and by the end of the 1947 crop year the industry's problem proved to be far from one of oversupply. Consumption for the 1947 crop year reached a record 9·2 million bushels, and industry specialists estimate that the demand is increasing currently at the rate of a million bushels per year.

Current reports on the 1948 cucumber crops indicate that unseasonably dry weather in some areas cut down tonnage deliveries to processors. Bulletins of the Institute of Food Distribution have commented on the well-sustained summer demand, with particular emphasis on sweet pickles, sweet chip, sweet mixed, and dill and vinegar varieties.

Basic pickling vegetable is, of course, the cucumber, processed at various stages of its development in whole or sliced form, or chopped and mixed with various other vegetables. Many combinations of spices and sauces produce widely differing flavours and degrees of sweetness or tartness. Brine, or vinegar with salt, is the pickling medium used.

A recent survey showed sweet pickles in the lead with 43·7 per cent. of first choice mentions, dill in second place with 30 per cent., and miscellaneous varieties third with 24·1 per cent.

An overwhelming majority preferred to buy pickles in jars, 32 per cent. preferred bulk, and 1·1 per cent. showed preference for the canned product.

About one-fourth expressed dissatisfaction with the containers in which pickles are packed. Largest number of criticisms were made of pry-off lids as against screw tops, both on the score of difficulty of reclosing and on cut-down re-use value. Tall, narrow-necked jars or bottles, such as are sometimes used for packaging gherkins, also met with adverse criticism because of the difficulty of getting the pickles out whole and undamaged.

Glass is the most usual commercial packaging for domestic pickles, with shapes and sizes of jars varying with type of content. Recent development in pickle packaging is the use of Cellophane or Pliofilm bags.

Biscuits and Crackers

From the early days, magazine advertising has been an important factor in building demand for packaged biscuits and crackers, and the consequent expansion of the industry to include a wide variety of shapes and types in both crackers and biscuits. In the latter category, plain vanilla wafers and ginger snaps were soon followed by sandwich types with fruit or sweet paste fillings,

and by iced confections in a wide range of shapes and flavours. The standard square soda cracker was joined by round and oblong versions in several sizes, and in some varieties cheese and other flavourings were added in the baking process.

One significant merchandising development aimed at increasing consumption of packaged crackers is the promotion of related point of sale displays, showing crackers with various types of spreads and offering suggestions for their services in ways other than as the traditional accompaniments to soup and salads. One such promotion was based on research findings of the National Biscuit Company to the effect that about one-third of all flake soda crackers consumed in a year are eaten with preserves, jams, jellies, or other fruit spreads.

Packaging has always played an important role in the biscuit as well as in the cracker industry, both in making it possible to preserve freshness and for the sake of eye appeal. Decorative cartons serve to identify the products and to connect them in the consumer mind with the advertised trade mark, and the use of Cellophane and other transparent wrappings add display value at the point of sale.

Beet Sugar Treatment

THE extraction of beet sugar juice at low temperature and the application of ion exchange in the production of beet sugar are the subjects of a detailed review by W. Visser, G. S. van der Vlies, and H.-I. Waterman in *Chimie et Industrie*, **61**, 4, 337.

For a long time the possibilities of "demineralisation" for the sugar industry have been recognised. Up to the present there have always occurred in molasses serious losses of sugar in large measure, owing to the mineral contents of the juice. Research has been carried out, mainly in the U.S.A., to examine the practical possibilities of ion exchange. In these investigations the problem to be solved was: what stage of the process was the most suitable for the treatment of the juice?

The authors give a detailed account of the procedure employed at the different stages, and summarise the work as follows:

(1) It has been found possible to extract the cosettes at 35-40° C., while adding SO_2 in the diffusion battery at the rate of 0·3 per cent. of the weight of beet.

(2) The exhaustion of the beet, under the experimental conditions, was found to be slower than that achieved by the usual method of diffusion.

(3) The thin juice produced by diffusion at low temperature was found to be more readily purified by ion exchange than the normal thin juice.

(4) The direct treatment of normal thin juice with SO_2 does not produce a juice endowed with the same properties as a diffusion juice obtained by sulphitation.

(5) After several percolations of the diffusion juice obtained by sulphitation, a decline in the activity of cation exchange was observed. The method of regeneration employed has therefore not been found entirely efficacious.

(6) A precipitation of colloids in the *p*H acid zone was found to be more effectual with diffusion juice obtained by sulphitation than with normal thin juice.

The Sense of Taste

A MONOGRAPH* on the sense of taste with special reference to sweetness should be of considerable value to food technologists. The anatomy and physiology of taste, the variability of taste perception in different individuals, the relationship between the chemical constitution and tastes of organic compounds, and the taste sensations other than those of sweetness are discussed in this monograph by the late Prof. A. T. Cameron, who was both a physiologist and a chemist.

Early work on the relative sweetness of sugars occupies an interesting section of the monograph. Prof. Cameron came to the conclusion that there were numerous gaps in our present knowledge of the sweet taste and of taste generally, but predicted that some of the many problems which suggested themselves might not be capable of solution. The localisation of the cortical area of the brain concerned with taste as in the parietal operculum, while probably correct, cannot yet be regarded as finally proved; this problem should be capable of definite solution.

The suggestion made that the intensity of taste perception resulting from the stimulation of "sweet" taste-cells by a sweet solution is perhaps capable of modification by other non-sweet or even tasteless stimuli applied to the same taste-cells needs careful examination before it can be finally accepted. There is much need for further study of the sweetness of mixtures, both mixtures of sweet substances and of substances with other tastes and without tastes. Little accurate work has been done in this field. According to the author most gustatory sensations are in large part due to mixed taste stimuli, and experimental studies would almost certainly yield results of constructive and practical value.

The author index and the classification of references enhance the value of this stimulating monograph.

* *The Taste Sense and the Relative Sweetness of Sugars and Other Sweet Substances.* By Professor A. T. Cameron, C.M.G., D.Sc., F.R.S.C. (Scientific Report Series, No. 9). Pp. 72+index. Sugar Research Foundation, Inc., New York. 1947. Free.

Candied Fruits

C. TREVOR WILLIAMS

Candied fruits have maintained their popularity as a sweetmeat delicacy throughout the centuries since sugar was first extracted from the cane. Generally speaking, candied fruits are almost devoid of the characteristic flavour of the natural fruits owing to the high percentage of sugar absorbed. It would be a distinct improvement if the appropriate flavour and acidity were incorporated in the fruit without deleterious effect on the sugar syrups.

A NUMBER of fruits, other than the usual citrus peels, orange, lemon, and citron, lend themselves to the sugar impregnation process. The French have excelled in the production of *glacé* fruits for many centuries, and an examination of a box of "Metz" fruits will show that the most popular varieties used are apricots, peaches, small pears, pineapple, angelica, green plums, and cantaloupe melon, with possibly cherries to add to the effect.

The impregnation of fruits and fruit peels with sugar syrup, and subsequent glazing with supersaturated sugar solution, are processes which should not be hurried unduly. The production of these useful commodities may be organised for handling large quantities, but carried on quite independently of any other manufacture in the same establishment, since the plant required for efficient working occupies considerable space.

As a general rule, the minimum total sugar solids content of the impregnated fruit should be 75 per cent. Fermentation will undoubtedly occur in the fruit if the absorbed sugar is less than this figure. Furthermore, the process must be carried out thoroughly, otherwise the fruit will sweat and shed its final coating of glazed sugar. Fresh fruits are processed immediately owing to the rapidity with which they ferment.

The fruits are usually subjected to a pre-treatment of hardening in which the fruit is packed and

Peel syruping plant, showing the vacuum pans and the vats.
Courtesy William Brierley, Collier and Hartley.

stored in a brine consisting of a 15 per cent. salt solution and sulphurous acid to the equivalent of 2,000 parts per million sulphur dioxide. In the case of citron peel, a 15 per cent. salt solution and 1 per cent. calcium chloride will give a firm texture. For all fruits, an initial minimum of 15 per cent. salt solution is recommended.

Preparation of the Fruits and Peels

Oranges, lemons, and grapefruit are halved and de-pulped before brining. Citrons are halved but not de-pulped until ready for syruping. Apricots, peaches, and greengages are de-stoned by slitting the base of the fruit. Pears, which should be small and firm, are cored and peeled preparatory to brining. Pineapple and cantaloupe are peeled and sliced into appropriate shapes.

Brining Operation

The fruits, after initial preparation, are packed tightly in casks and the salt solution and sulphurous acid added to fill the casks completely. Fermentation must be avoided to prevent softening of the fruit. The exception to this procedure is citron peel, which is packed tightly in casks of 6 to 8 cwt. capacity, the casks being filled with salt solution. The bungs are left open for a period of eight to ten days to allow fermentation, which is necessary to mellow this fruit. When the fermentation process is complete, the casks are re-opened at the head, the fruit sorted and inspected for spoilage, and the casks refilled with sound fruit tightly packed. They are then coopered and refilled with brine and sulphurous acid and stored until required.

Syruping Process

The casks are opened and the brine allowed to run out. Cold water is passed over the peel in a continuous stream to leach out as much brine as possible. Thence the peel is conveyed to inspection tables for sorting and checking. The checked peel is transferred to a series of wooden vats each capable of holding 3 to 3½ cwt. peel. These vats are usually fitted with a perforated steam coil in the base. Cold water is added to cover the peel completely and boiled for fifteen minutes to assist the leaching out of the brine and to soften the fruit. The peel caps are transferred to a further series of vats, and the fruit soaked for twelve hours in cold water which is changed four or five times during the day. This completes the leaching process and has the effect of firming the fruit.

The peel is now placed in tiled cement vats, the usual capacity being about 7 cwt. of peel and 8½ cwt. of syrup. A cold sugar syrup of 32° Baumé is piped into the vats to cover the peel, which is allowed to stand for forty-eight hours. The syrup is returned to the melting pan of a vacuum pan unit, and to every 12½ cwt. of syrup 2 cwt. of sugar are added. This is dissolved and pumped into the vacuum pan in which it is boiled for twenty minutes at 15 in. vacuum to reach 192° F., giving a density of approximately 36° Baumé. The resultant syrup is pumped to the vats while hot and the peel allowed to remain in it for twenty-four hours. For the next charge, the syrup is pumped back into the melting pan and 1½ cwt. of sugar and ½ cwt. of corn syrup are added. Again the solids are dissolved and the solution piped into the vacuum pan for a further boiling of fifteen minutes at 15 in. vacuum. This syrup, restored to a density of 36° Baumé, is then pumped into the vats and the caps allowed to stand in it for twenty-four hours.

Draining "marrons glacés" in a French factory.
Courtesy Société Nationale d'Exportation des Chocolateries et des Confiseries.

A final syruping is carried out in the same way, 1 cwt. of sugar being added to the returned syrup in the melting pan and the solution boiled at 15 in. vacuum for ten minutes. The peel caps are allowed to remain in this syrup for forty-eight hours, after which they are drained thoroughly and transferred to sorting tables where they are checked and graded. The sorted peel is placed on wire trays in hot rooms to dry at a temperature of 150° F. for eight to ten hours, or ten to twelve hours for citron peel owing to its larger bulk. If necessary, the drained caps may be quickly dipped in hot water to rinse off surplus syrup before passing into the hot rooms.

Glazing the Fruit

Sugar and water are placed in a small steam pan in the proportion of 2:1 respectively, and in predetermined quantities to accomplish the glazing process without an unnecessary surplus of syrup. The sugar is thoroughly dissolved and the solution boiled to 235° F. Heating is discontinued, and the well-dried impregnated fruit is placed in the

Tiled vats in a peel syruping plant.
Courtesy William Brierley, Collier and Hartley.

supersaturated sugar solution, followed by the setting up of a local granulation in the syrup by rubbing the side of the pan with the spatula. The fruit pieces are rapidly forked out, each passing through the granulated portion, placed on wire trays and allowed to stand for twenty-four hours in a dry, warm room. The fruit will then have acquired a crisp, dry, sugar glaze and be ready for packing.

Pineapple

When the peeled and sliced pineapples are placed in brine and sulphurous acid a slight fermentative action takes place, which softens the tough fibres of the fruit and facilitates subsequent absorption of sugar syrup. This action is soon arrested by the brine solution and the fruit is not affected adversely.

After an initial short boil in water to leach out the brine, the fruit is placed in cold water and allowed to stand until chilled. This restores a degree of crispness to the pineapple. The fruit is transferred to wire trays, stacked in vats, and covered with hot 20° Baumé sugar syrup, acidulated with 0·1 per cent. citric acid, in which it is allowed to remain for twenty-four hours. The syrup is then withdrawn to the vacuum pan unit and sufficient sugar added to restore the density to 20° Baumé. This syrup is pumped back on to the fruit in the vats and allowed to stand for twenty-four hours. Subsequent syrupings are given to the fruit at twenty-four hour intervals, increasing each by 3° Baumé until a density of 28° Baumé is reached. The syrup is again treated in the vacuum unit, and sufficient sugar-corn syrup mixture (25 per cent. by weight of corn syrup) added to raise the density to 41° Baumé at boiling point. This syrup is pumped to the vats and the fruit allowed to remain in it for four days, after which the syrup is drained off.

Each tray is then dipped quickly in hot water to rinse off surplus syrup and the fruit laid out on drying screens to be passed into hot rooms at 150° F. until the correct degree of dryness is attained. The minimum amount of total sugar solids should be 75 per cent. to prevent fermentation.

Greengages

Greengages are freed from brine and sulphurous acid as previously described and boiled in an 18° Baumé sugar syrup until tenderised. When this point, ascertained by testing several pieces, is reached, the fruit is allowed to stand in the syrup for forty-eight hours. It is an advantage to lay the fruit in shallow wire trays in the syrup vats to allow free access of the syrup to each piece. The syrup is withdrawn and treated in the vacuum unit to increasing densities, 20°, 27°, 32°, 37°, and 40° Baumé by the addition of appropriate quanti-

Vacuum pans connected to syruping vats in a French factory.
Courtesy Société Nationale d'Exportation des Chocolateries et des Confiseries.

ties of sugar and also adding to the 27° Baumé syrup 25 per cent. by weight of corn syrup. Each charge of syrup is returned to the fruit and allowed to stand for twenty-four hour periods, with the exception of the final syrup in which the fruit remains for four days. Finally, the fruit is drained, dipped momentarily in hot water to remove the surplus syrup, and placed in wire trays in hot rooms at 150° F. to dry. The fruit is then glazed as described.

Pears

Small, firm pears only are used; these may be preserved or fresh. In the latter event, the pears are cored and peeled, then placed immediately in brine solution to prevent discoloration. The fruits are boiled in water to expel the brine and to tenderise the fibres and pierced with stainless steel wires to allow later penetration of the syrup. Since syrup-impregnated pears would look extremely insipid without some coloration, the fruit is usually dipped in a fairly strong colour solution, either green or red, before syruping. The softened and coloured fruits are cooled in running water and placed in wire trays which are transferred to the vats and covered with a hot sugar syrup at 18° Baumé in which they remain for forty-eight hours. The subsequent syrupings and glazing procedures are identical with those described for greengages.

Apricots

Fresh apricots and those preserved with sulphur dioxide are used for processing. The fruits are de-stoned by slitting the base and extracting the stone, thus preserving a reasonable shape in the final product. In actual fact, the shapes of glazed fruits are usually distorted owing to unequal shrinkage. This, however, is offset by attractive package presentation. It is interesting to note a method evolved by Jang and Cruess (*Fruit Products Journal*, **26**, 8, 229) which is claimed to produce plump impregnated fruits in reduced time. This process involves the placing of the pre-boiled fruit (30° Brix syrup) in a vacuum vessel in which it is covered with a syrup of 75° to 80° Brix concentration. A very high vacuum is applied until the syrup and fruit are exhausted of air—that is, for a period of one hour. In the absence of heat, a rapid equilibrium is established between fruit and syrup. The fruit is allowed to remain in this syrup for twenty-four hours, then the latter is restored to 75° to 80° Brix density by the addition of fresh syrup of appropriate density, the vacuum treatment being repeated. Subsequently, the fruit is allowed to stand in the syrup for twenty-four to forty-eight hours, drained, rinsed in hot water, and finally dried at 150° F.

Glacé Cherries

Cherries are preserved in brine and sulphurous acid or calcium bisulphite. The fruit is drained of preservative, pitted, and washed for at least twenty-four hours in running water to eliminate the greater part of the sulphur dioxide. It is then transferred to vats fitted with steam roses in the base, and covered with water, the fruit being allowed a certain freedom of movement. The cherries are kept under the surface of the water by means of a perforated wooden disc, and boiled in several changes of water until tender, any impurities being skimmed from the surface to prevent discoloration. The fruit is then allowed to cool and fresh cold water passed into the vat, in which the fruit is left for twenty-four hours to complete the leaching process.

The cherries are drained off, placed in vats, and covered with cold sugar syrup at 20° Baumé containing ·02 per cent. to ·05 per cent. Erythrosine or Ponceau 3R, or a mixture of these dyes according to the shade of colour required. The cherries are allowed to remain in this syrup for twenty-four hours, after which time the syrup is drawn off, and boiled *in vacuo* with sufficient sugar-corn syrup added to increase the density 2° Baumé. This process is repeated on alternate days until the final syrup contains 75 per cent. soluble solids. The fruit is left in this syrup for four days, then quickly boiled and drained. It is finally dried in hot rooms at 150° F. and sorted into the required grades. The cherries may then be glazed in sugar syrup as previously described.

Crystallised Fruits

The crystallising of sugar-impregnated fruits as distinct from sugar glazing is carried out in a manner similar to that for crystallising sugar confectionery.

A supersaturated sugar syrup of 36° Baumé is made, poured into metal vessels, and allowed to cool to room temperature, precautions being taken to prevent premature granulation in the solution. Usually a large sheet of waxed paper is laid on the surface of the syrup while hot to avoid contact with the atmosphere. The fruits are carefully laid out in wire baskets and stacked in a large tank. The cooled syrup is run into this tank with as little agitation as possible until the whole of the fruit is just covered. Waxed paper sheets are again laid over the surface of the syrup. The period of immersion in the syrup is twelve hours, after which the syrup is drained off and the fruit placed separately on wire trays to dry at room temperature.

ACKNOWLEDGMENT

The author of "The Hydrogenation of Oils," published in the July and August issues of FOOD MANUFACTURE, regrets the omission of his acknowledgment to Power-Gas Corporation, Ltd., Bamag, Ltd., and Cyamid Products, Ltd., for data and illustrations forming the basis of his article.

Standards for Processed Cheese

The Minister of Food has approved for publication a report containing recommendations for standards for processed cheese made by the Food Standards Committee which was set up in January, 1948, to review the composition of foods and to recommend standards based on quality and nutritional value, designed to protect consumers against the sale of inferior products.

THE Food Standards Committee has considered a proposal from Associated Cheese Processors, Ltd. (affiliated to the Food Manufacturers' Federation), that standards should be prescribed for processed cheese.*

"Process cheese," as defined by the trade, "means cheese, containing no fat other than fat derived from milk, which after manufacture has been heated and to which an emulsifying agent has been added. Process cheese may additionally be described to indicate the variety of the original cheese, *e.g.* Cheddar, Cheshire."

Their proposals embraced cheese products of the following descriptions: (*a*) Processed cheese; (*b*) processed (Gruyère and Emmenthal) cheese; (*c*) processed (skim milk) cheese; (*d*) cheese spread.

In the view of Associated Cheese Processors, Ltd.: (*a*) Colouring matter may be added to any description of processed cheese, subject to the requirements of the Food and Drugs Acts. (*b*) Colouring matter, flavouring substances, emulsifying salts, and/or stabilisers, in addition to any milk products, may be added to cheese spreads, subject to the requirements of the Food and Drugs Acts.

The following standards were proposed:

Description.	*Minimum Fat in Dry Matter (Per Cent.).*	*Maximum Water (Per Cent.).*	*Maximum Emulsifying Salts (Per Cent.).*
Processed cheese ..	48	42	3
Processed (Gruyère and Emmenthal) cheese	45	45	3
Processed (skim† milk) cheese ..	35	50	3
Cheese spread ..	45	48	—

In preliminary discussions with the Ministry of Food, Associated Cheese Processors, Ltd., considered that the proposed standards were so closely prescribed that no useful purpose would be served by disclosing the ingredients on the labels, and that the labels affixed to portions of processed cheese were too small to contain so much information.

The Committee has consulted appropriate Government Departments, Associated Cheese Processors, Ltd., the British Dairy Farmers' Association, and the National Institute for Research in Dairying, and has obtained data on the fat and moisture content of cheese and processed cheese from a number of authorities and from several cheese processing firms. In addition, some members of the Committee visited a cheese processing factory in order to obtain first-hand information on the manufacturing process.

* Or "process" cheese, *vide infra*.
† Subsequently withdrawn, *vide infra*.

Summary of Evidence

(i) The processed cheese industry is relatively new in the United Kingdom. The industry has been developed by a small number of firms who consider that their products are quite distinct from ordinary cheese, and that considerable skill and experience are needed, *e.g.* in the technique of blending, to produce a satisfactory processed cheese or cheese spread.

(ii) The total pre-war sales of processed cheese, including cheese spreads, were approximately 18,000 tons per annum. Since the concentration of the industry the use of small retail packs has been suspended, and supplies for retail sale are now produced in 5 lb. blocks. The manufacture of cheese spread has also been suspended.

(iii) Cheese is selected for processing on the basis of quality, flavour, texture, and acidity. The selection is determined by the need for a strong, medium, or mild blend in the processed cheese. Samples of the blend are analysed for fat and moisture content. Usually not less than six cheeses would be selected for blending.

(iv) Before the war, some processed cheese was made entirely from home-produced cheese, but a number of processors blended imported and home-produced cheeses. At the present time, at least one brand of processed cheese is made entirely from blends of Canadian and New Zealand cheese with fat content of 51 per cent. to 53 per cent., resulting in an average of 50 per cent. fat in the dry matter in the processed cheese. Processed cheese blended exclusively from home-produced cheese would be likely to have a lower fat content than a product containing a significant proportion of cheese imported from Commonwealth countries or the U.S.A. The average fat content in the dry matter of home-produced factory-made cheese is 50 per cent. Home-produced farmhouse cheese is

usually lower in fat content than factory-made cheese, and this was no doubt taken into account when a 45 per cent. minimum fat content was prescribed under the National Mark Scheme. The quantity of farmhouse cheese produced is, however, a small proportion of the total cheese production in the United Kingdom, and it has been suggested that the minimum fat content of 45 per cent. could be improved.

In any case, manufacturers of processed cheese are unlikely to make it solely from a blend of home-produced cheese.

(v) Gruyère and Emmenthal cheese are made from partly skimmed milk. The recognised world requirement for these types of processed cheese is a minimum fat content of 45 per cent.

(vi) Sodium phosphate and sodium citrate are normally used as emulsifiers; occasionally tartrates are used. At least 1 per cent. emulsifying salts is regarded as necessary in order to ensure the stability of the processed cheese. It should be possible for every cheese processor to work within a maximum of 3 per cent. A higher proportion than 3 per cent. would result in a progressive deterioration in the quality and flavour of the processed cheese. A maximum of 3 per cent. emulsifying salts was accepted by the International Dairy Federation in 1937.

(vii) Associated Cheese Processors, Ltd., suggested the use of the description "process cheese." The Committee was informed that this term is used in preference to "processed" in the U.S.A. and in New Zealand, but that other countries (including Commonwealth countries other than New Zealand) use the term "processed cheese."

(viii) The trade witnesses said it would be possible to manufacture flavoured processed cheese (that is, processed cheese flavoured with *e.g.* pimento, tomato, celery) conforming to the proposed standard, but they were of the opinion that such products should be marketed as mixtures and not as processed cheese. The representative of the British Dairy Farmers' Association was of the opinion that in the event of a flavoured processed cheese being produced it should conform to the standard for processed cheese.

(ix) The trade witnesses were of opinion that a standard should not be prescribed for skim milk cheese and withdrew the proposal for a standard for this type of product.

(x) Cheese spread was described as a product consisting of a mature, hard cheese as base with the addition of milk products such as skim milk, butter, etc. In the U.S.A. the base of cheese spread is Cheddar cheese, with the addition of milk powder and butterfat, emulsified with a little water to make it soft and spreadable. Before the war there was a popular demand for cheese spreads in Great Britain, but some inferior products had a water content as high as 62 per cent.

A maximum limit for the emulsifying salts used in cheese spread was not contained in the original proposals for standards, but in evidence the trade witnesses recommended that a limit of 3 per cent. should be prescribed.

Subsequently, at the request of the Committee, Associated Cheese Processors, Ltd., prepared the following definition of cheese spread:

> Cheese spread means processed cheese which has been made to spread easily by the addition of one or more milk products only, and contains not less than 45 per cent. butterfat included in the dry matter, and not more than 48 per cent. moisture.

The Committee's Conclusions

In reaching its conclusions, the Committee has recognised the need for protecting the consumer against the sale of inferior products when manufacturers are again free to market prepacked processed cheese under trade names. The Committee understands that processed cheese (in addition to the "loaf" processed cheese available on the cheese ration at subsidised prices) will then be available to the consumer on points at a price unsupported by subsidy.

It was suggested by one of the witnesses that standards should be prescribed for ordinary cheese first and that these should be used as a guide in preparing standards for processed cheese. The Committee agrees that the possibility of prescribing statutory standards for cheese should be examined, but considers that for the reasons mentioned below standards can be prescribed for processed cheese without prejudice to any standards which may subsequently be recommended for ordinary cheese.

The view expressed in evidence by the trade that processed cheese should be made only from cheese made from whole milk is accepted.

In endorsing the proposal for a minimum butterfat content of 48 per cent. in processed cheese, the Committee has attached primary importance to the manufacturer's freedom of selection and the fact that imported cheese of high fat content is invariably included in the blending of cheeses for processing.

The Committee accepts the standards proposed for cheese of the Gruyère and Emmenthal varieties which conform to the standards of composition prescribed in the country of origin and generally accepted in other countries.

It is considered that flavoured processed cheese, unless it is described as a mixture, should conform to the standards recommended for processed cheese.

The Committee is satisfied that the maximum moisture contents proposed by Associated Cheese Processors, Ltd., for the various types of processed cheese are reasonable.

The evidence of the trade on the amount of emulsifying salts used is accepted. It understands that some manufacturers are able to produce a satisfactory processed cheese with as little as 1·5

per cent. emulsifying salts, but considers that a maximum of 3 per cent. would allow more latitude in the type of emulsifying salts used.

While the determination of the percentage of emulsifying salts present in a sample of processed cheese may present some difficulty, the Committee is satisfied that the enforcement of the standards recommended can be supported by chemical analysis.

On the question of nomenclature Associated Cheese Processors, Ltd., proposed that the term "process cheese" should be used in this country, but the Committee understands that they have no very strong views about it, and as the term "processed cheese" is well known in Great Britain and is the more natural form of expression, the Committee prefers it. At the same time, the Committee sees no objection to the alternative use of the term "process cheese."

A single recommendation relating to the disclosure of ingredients on the label cannot be made for all types of processed cheese. The composition both of ordinary processed cheese and of Gruyère and Emmenthal processed cheese is closely prescribed by the definition and by the standard recommended, and the Committee considers there is no need to require a disclosure of the ingredients of these products. In the case of flavoured processed cheese it considers that the public is entitled to know what the flavouring ingredient is and this should be included in the description. The composition of cheese spread cannot be so closely defined as that of processed cheese. Accordingly, it is the view of the Committee that the ingredients of cheese spread should be disclosed on the labels of the retail packs.

The attention of the Committee has been drawn to the possibility of metallic contamination of processed cheese from the metal foil wrappings. The possibility has been investigated by the Metallic Contamination Sub-Committee, who advised that such contamination could be prevented by suitably coating the metal foil. The Committee is informed that British Standard No. 1463, 1948, specifies, *inter alia*, that tin foil used for wrapping cheese shall have a protective coating on one or both sides of the foil, the composition of the protective coating being such that it does not introduce into cheese substances injurious to health. In view of this specification the Committee considers it unnecessary to prescribe limits for the metallic contamination of processed cheese.

Recommendations for Standards

(*a*) *Processed Cheese.*—It is recommended that processed cheese be defined as cheese which has been heat-treated with or without the use of emulsifying salts, and the fat of which consists entirely of butterfat. Colouring matter may also be added.

Flavoured processed cheese means processed cheese to which a flavouring substance has been added.

Fat and Moisture Content.—There should be prescribed a minimum butterfat content of 48 per cent. in the dry matter, and a maximum moisture content of 42 per cent. for processed cheese; a minimum butterfat content of 45 per cent. in the dry matter, and a maximum moisture content of 45 per cent. for processed cheese of the Gruyère and Emmenthal varieties.

Emulsifying Agent.—There should be permitted a maximum quantity of 3 per cent. emulsifying salts, commonly known in the trade as "cheese melting salts," for all types of processed cheese.

(*b*) *Cheese Spread.*—It is recommended that cheese spread be defined as cheese prepared to spread easily by the addition of one or more milk products, with or without the application of heat. Emulsifying salts, colour matters, and flavouring substances may be added. It shall have a minimum content of 45 per cent. butterfat in the dry matter and a maximum content of 48 per cent. moisture.

(*c*) *Labelling.*—There should be disclosed on the labels the ingredients of cheese spread in accordance with Article 2 of the Labelling of Food Order (S.R. & O. 1946, No. 2169).

Flour Confectionery

BISCUITS, cakes, and other flour confectionery as food was the subject discussed at the second meeting of the series on "The Nation's Manufactured Foods" arranged by the Nutrition Panel of the Food Group of the Society of Chemical Industry.

The first paper was read by Mr. S. W. Butterworth and dealt with the classification, definition, and composition of flour confectionery. With the aid of grouped products arranged in three sections he described the basic composition of each type of flour confectionery and classified it accordingly. In Section 1, equal parts of flour and water formed a fluid batter; in Section 2, two parts of flour to one part of water formed a plastic elastic dough; and in Section 3, three parts of flour to one of water formed a plastic paste.

Discussing cakes as food, Mr. C. H. F. Fuller showed tables of contents of varieties of cakes by means of slides, giving the composition of each.

The nutritional value of biscuits was emphasised by Mr. D. M. Freeland and Mr. A. B. Bradley in their paper "Biscuits as Food." While biscuits consist essentially of wheat and flour made into a dough with water and milk, the multitude of varieties is obtained by the addition of other ingredients.

In the closing paper Professor J. Yudkin reviewed the whole subject of biscuits, cakes, and flour confectionery, emphasising their importance in the everyday diet.

Present-day Trends in Food Packaging

FRANK ENGLAND

The aim of food packers today is to regain the quality, cleanliness, and shelf appeal of the 1939 packs. To achieve this, the manufacturer can call upon the assistance of research workers whose activities extend to every department of packaging and whose work has never been more active.

THE tendency to look back to pre-war standards should not be underrated, for it exists to some extent in the field of research itself. To quote the words of a leading research authority: "There are only three main trends in food packaging—better protection, better hygiene, and better looks." He expressed the view that for the short-term aim the pre-war standard of packaging offered an objective which by no means should be considered unworthy.

Research is being devoted to the prevention of deterioration of contents caused by the transmission of moisture from the outside to the inside of packages, a process which makes the contents soggy, and by the transmission of moisture from the inside to the outside, whereby the contents become dry.

Complex Export Problems

Deterioration from either of these causes presents problems, particularly for the export trade. One such problem arises when the manufacturer desires to take advantage of newly developed methods of sealing so that freshness and flavour can be retained for much longer periods, but knows that any exterior alteration of packs would be detrimental to his sales. For example, in some markets it has become a custom for the local inhabitants to use empty containers for different purposes. In other markets, external alteration would be fatal because the purchasers of the product would at once conclude that a substitute was being offered. To secure the advantages of modern sealing methods without visibly altering the exterior of a pack is sometimes difficult but not impossible.

Steam Injection Principle

Recent research carried out by The Metal Box Company into the use of the steam injection principle in food processes is proving of considerable interest. This method, which has made marked progress and is growing in popularity in the United States, has been successfully used in the processing of such foods as vegetables, baby foods, some fruits, and fish and meat products.

Some experimental work has been carried out on the Campden Research Station seamer which was fitted with a steaming device by The Metal Box Company. Suitable types of seamer for the process are those in which the entire seaming operation on any can is done in one head, *i.e.* M.N. 6 or Canco 400, and, provided there is a demand, the company will arrange for the production of a number of these seamers so that canners may make commercial size trial runs if they so desire.

Composites for Frozen Foods

The composite container consisting of a cardboard body with metal ends, which has been familiar in packaging for more than thirty years, is now being extended to the packaging of frozen foods.

The body, which is made with an inner lamina of foil, is wax-coated externally to render it moisture-vapour-proof. The foil lining makes it unnecessary to use an inner wrapper or bag to protect the contents, and enhances the clean, hygienic appearance of the pack when it is opened. The tinplate ends are crimped on to the body in the

Composite containers for frozen foods, the metal ends of which militate against package collapse after defrosting.

normal way, but a special tool has had to be devised to handle the oblong shape. The increased rigidity thus imparted to the pack is particularly valuable where soft fruit or other easily damaged products are to be packed, and is essential where juice is present after defrosting.

Many developments may be expected in the packaging of frozen foods. An interesting new material in this field is the plastic Alkathene developed in the I.C.I. laboratories.

A New Lacquer

A good deal of attention is being paid to the development of new lacquers for the lining of food cans. One of these, of Swiss manufacture, is appearing under the trade name of Araldite. Used as a surface coating for the interior of aluminium containers, this synthetic adhesive is claimed to have great resistance to chemicals, to protect both can and contents, and to possess unusual flexibility.

In a test with tomato *purée*, a can coated with the adhesive 0·008 in., stoved at 180° C. for sixty minutes, filled with *purée*, then sterilised at 120° C. for twenty minutes, was found to have its surface unchanged when opened.

Its flexibility is said to make it specially suitable for aluminium containers and tubes for the production of which extrusion is the almost universally adopted method. Containers produced from pre-Araldite-coated aluminium can be drawn to a considerable depth. The adhesive is also applied as a colourless coating to aluminium foils used in packaging foodstuffs. It is said to be widely used in Switzerland where the aluminium container is becoming popular, but its potentialities in this country have yet to be realised.

Glass Containers

Trends in the glass container industry are concerned with appearance, economy, and safety in transit, design being aimed at securing all three objectives. This is not solely a matter for the industry; it is largely influenced by the packer's experience in shipping glass container products to all parts of the world, and necessitates constant consultation between the glass container industry and the packer. That the use of glass containers is increasing, especially in relation to milk, jams, sauces, pastes, and pickles, is demonstrated by the fact that the total production of glass containers in 1938 for food and drink was 11 million gross, whereas now the figure is 21 million gross, or 3,000 million containers a year.

Peek Frean's Cheeselets are now available for the export market in a newly designed tin.

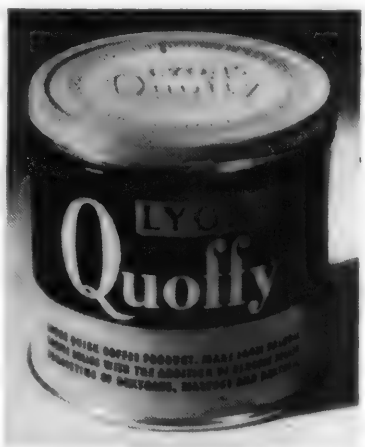
"Light-weighted" glass is closely connected with design intended to secure economy and safety in transit. Conspicuous users of these containers are Maconochie's, who prefer them to the heavy-based and thickly ribbed glass containers used for some pastes. The glass container industry, however, does not like the term "light-weighted" glass. It is held to suggest a weaker container, whereas in actual fact a good design made in "light-weighted" glass makes a much stronger one than the older heavily decorated type of glass container which is still a competitor. A point not to be overlooked about "light-weighted" glass is the opportunity it offers for attractive labelling.

Bread Wrapping

It is difficult at the time of writing to say what is likely to happen about bread wrapping, since the bakers are confused and unhappy about the attitude of the Ministry of Food and about the bread-wrapping allowance of ¼d. a small loaf, which is generally recognised as inadequate.

There is also the difficulty about supplies of waxed paper and cellulose film. It is hoped that these will increase, and that plans to devise a simple sealing device for use in the baker's shop may materialise. Whether the use of film in place of waxed paper is practicable today is a matter which is being investigated.

A major difficulty connected with the large-scale wrapping of bread is the heavy cost of installing machinery and equipment.



Lyons Quoffy is being packed in a dark brown and red tin, with a red lid.

A new glass jar range for Horner confectionery destined for the export market.

Two recent announcements give some indication as to future trends in the packaging industry.

Extensions of Research

One of these relates to the extension to non-members on a fee basis of the Packaging Advisory Service, *Packaging Abstracts*, the Package Testing Station, and Library of the Research Centre at Leatherhead operated by the Printing, Packaging, and Allied Trades Research Association. Under the new extension of services, non-members may have tests for permeability made for £5, of strength of materials for £1, of the strength of packages for £7, for insect attack for £10, and for mould or bacterial attack for £15. Storage tests can also be made under temperate, tropical, or arctic conditions in specially constructed storage rooms for £1 per month per square foot of the largest face of a package.

This action should lead to a considerable extension of research, especially on behalf of food manufacturers.

Packaging Standards

The second announcement concerns the *British Standard Packaging Code*, which has been revised and extended under the supervision of the B.S.I. Packaging Standards Committee. The revised Code will be made available in seventeen sections.

It is impossible to indicate at this juncture what trends may follow its publication, but reference may be made to the hope expressed by Sir William Larke, President of the Institution, that the Code will secure widespread recognition and adoption. Adequate standards of packaging will gain us business and goodwill in the difficult sellers' market and strengthen our competitive power.

Bread Softeners and the Meat Packing Industry

A GREAT deal of interest is being shown in the hearings being conducted by the U.S.A. Food and Drug Administration to determine a definition and "standards of identity" for bread. The findings of the Administration will be significant for certain sections of the meat packing industry in view of the fact that enormous quantities of shortenings go to the bread manufacturers annually.

A flood of synthetic emulsifiers, sometimes called "bread softeners," has appeared on the market in the U.S.A. in the last three years, to be used as shortening substitutes or to enhance the effect of shortening in bread making. Propaganda for and against the use of emulsifiers has varied according to financial interest—equally good arguments being put forward in favour of using "softeners" and less shortening as there have been in decrying the use of "substitutes with no nutritive value."

It is generally admitted that the use of emulsifiers has a "softening" effect on bread. Softness can be measured by compressibility tests, which determine the amount of pressure required to sink a plunger a certain distance into a loaf. The term "softness" is not identical with "freshness," which cannot be measured and is often applied rather loosely.

Tests have proved that emulsifiers do not retard the rate of staling in bread; that is, while the bread is softer to begin with, the other characteristics which change as bread becomes older continue. However, if by using emulsifiers the bread is softer when baked, even though the rate of staling is the same, it is argued by some that the bread would have a longer "shelf life," or, perhaps more important since most bread is baked and sold the same day, "bread box life."

A significant statement was made in answer to a question put to a spokesman for one of the largest chemical companies. Asked whether his company recommends that bakers reduce the amount of fat with emulsifiers, he replied that they do not if the baker is striving for quality results. A spokesman for the American Institute of Baking stated that the Institute does not view emulsifiers as shortening substitutes. However, these synthetics were developed in Germany because of the poor supply of shortening before and during the war. They came into use in America during and after the war when shortenings were not readily available, and it cannot be denied that some manufacturers of emulsifiers are still selling them as fat substitutes.

The hearing of facts continues, but until all the evidence has been presented it is impossible to predict what the attitude of the Food and Drug Administration on the subject of emulsifying agents in bread will be and therefore what the effect will be on the fats industry.

Detection and Measurement of Foodstuff Spoilage

R. W. MONCRIEFF, B.Sc., F.T.I., F.R.I.C.

Part II

Because the decomposition products of proteins are volatile, soluble, and usually chemically oxidisable, it should be possible to evaluate them fairly readily. A chemical method for the assessment of food spoilage is described which gives greater precision than does testing by organoleptic methods.

IT was observed by Lang, Farber, Beck, and Yerman[9] that the *p*H value of the press juice obtained from samples of ground round beefsteak in various stages of decomposition increased as the degree of decomposition increased. The determinations were as follows:

Condition of Steak.	*p*H *of Press Juice obtained from it.*
Normal meat odour	5·01
Strong sour odour	5·48
Definite tainted odour	6·96
Foul putrid odour	7·33

The press juice from the round steak is acid while the steak is reasonably fresh, becomes neutral (*p*H 7) when the steak is definitely tainted, and alkaline when it is putrid.

pH Values

Inasmuch as *p*H values can be determined easily, accurate to ±0·01 with commercial *p*H meters which employ the glass electrode, with the calomel electrode as a reference, it seems to be quite possible that an estimation of the *p*H value of the press juice from a protein foodstuff might well be used to make an assessment of its freedom from decomposition. If the *p*H value of the fresh steak is 5·01, and that of the sample with a strong sour odour which is apparently not far from the borderline of edibility/inedibility is 5·48, the difference between the values is 0·47, and as *p*H can be easily determined to ±0·01 there are twenty intermediate degrees of acidity that can be measured. Clearly a good deal of spadework would be necessary to establish, first, if food of one kind, *e.g.* beef or tuna, had each a characteristic *p*H value when fresh. It appears not unlikely that it would have such a characteristic, and if indeed it has, then it would be a very simple matter to determine the condition of a protein foodstuff by measurement of its *p*H value.

It is interesting to recall that an increase in objectionable odour has been shown to run parallel with an increase in *p*H value in the case of another animal product, *viz.* perspiration. Barail[10] has made the surprising discovery that in normal persons fresh perspiration is practically odourless, and that it is only when the bacteria which inhabit the skin get to work on the perspiration and decompose it that offensive odours develop. When sweat is excreted by normal healthy persons its *p*H value is 4·5, and as bacterial decomposition proceeds the *p*H value rises to over 7, *i.e.* to alkalinity, and it is then that odorous offence ensues. The first change in the decomposition of the organic matter of sweat is an increase in the *p*H value, and this makes the medium most attractive to other bacteria, so that the rate of bacterial decomposition is accelerated; once decomposition has started, it progresses quickly, and bad odours rapidly become perceptible.

Probably similar circumstances attend the decomposition of a protein foodstuff. To begin with it is acid; then bacteria attack it, with difficulty at first. As they work, the acidity of the protein foodstuff is slightly reduced and the *p*H value rises a little, making conditions favourable for the activities of more bacteria. Once the process of decomposition has started, it rapidly accelerates, and as it does so the *p*H value rises; the fluid part of the foodstuff becomes alkaline and repulsive odours develop.

Such a mechanism clearly lends itself to estimation of the degree of decomposition by measurement of the *p*H value. Nowadays, a *p*H meter is to be found in every laboratory, and a wide range of instruments is offered for sale by the instrument makers. These are often much more sensitive than the purposes for which they are to be used warrant, but it may be that in appraisal of foodstuff spoilage their sensitivity may find useful application.

Chemical Methods

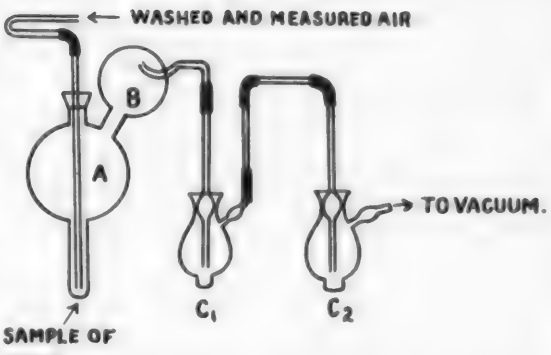
The strongly odorous materials that will give rise to offensive odours and flavours are those of low molecular weight. In particular they are those that are volatile, soluble, and chemically unsaturated. Such chemically unsaturated bodies are easily oxidised. If, therefore, the decomposition products of proteins are volatile, soluble, and usually chemically oxidisable, it should be possible to evaluate them fairly readily. A method for doing this has

been described by Lang, Farber, Beck, and Yerman.[9] Because they found that organoleptic testing is not always satisfactory owing to the influences of temperature, the masking of odours, personal preferences, the ability of one person to detect an odour more readily than another, and olfactory fatigue, they devised a chemical method.

Chemical methods had been used before this, but as a rule these had relied on the estimation of some substance such as indole or hydrogen sulphide, produced by the action of specific bacteria. If these particular bacteria were absent, although other bacteria that promoted decomposition might still be present, the indole or hydrogen sulphide estimation would be an unreliable guide to the amount of decomposition that had taken place. Lang *et al.* therefore used a method which depended on the separation of the volatile constituents from the foodstuff, and on the estimation of the amount of oxygen that these volatiles, from a foodstuff sample of known weight, would absorb. The method is logical and based on sound premises, inasmuch as it is the volatile oxidisable constituents of a foodstuff that are responsible for its odour and in the main for its flavour. The inventors of the method claim that it gives a good correlation with organoleptic testing, but that it is much more sensitive as it will detect deterioration before there is any noticeable change in the flavour of the foodstuff.

Carrying out the Test

In carrying out the method a press juice is obtained from the food under test, and is clarified. A 5 ml. portion is introduced into the test tube portion of the flask A (see Fig.), and 2 cubic feet of purified air bubbled through it in forty minutes. The bulb B is designed to prevent trouble from frothing. The air (now containing the volatiles from the press juice) then passes through the two 125 ml. Pyrex Erlenmeyer flasks C_1 and C_2, which each contain 10 ml. of 0·1 N $KMNO_4$ in 1 N NaOH solution. The volatiles are oxidised by the alkaline permanganate. After the expiration of the forty-minute bubbling period, the permanganate solution is removed from the two flasks C_1 and C_2 and mixed. To a 10 ml. sample of it is added 5 ml. 6N H_2SO_4 and then 10 ml. of 0·11 N ferrous ammonium sulphate in 0·01 N H_2SO_4. The permanganate that has not been used to oxidise the volatiles from the press juice oxidises some of the ferrous ammonium sulphate, and the quantity that it does so oxidise is determined by estimating the unchanged ferrous ammonium sulphate. This is done by titration with 0·01 N ceric sulphate in 1 N H_2SO_4 using *o*-phenanthroline ferrous complex as indicator. Titre differences of 1 ml. of the 0·01 N ceric sulphate correspond to a reduction of 10 micro-equivalents. Blank experiments (without press juice) are made, and the difference between the test and the control titres is proportional to the reduction expressed as micro-equivalents of reduction. It might be



Apparatus for carrying out a chemical test to detect food deterioration.

thought that air would not be a very suitable gas to sweep the volatiles through the permanganate solution, as it might possibly itself oxidise some of the volatiles, but although other gases have been used, the results obtained were not significantly different from those obtained when air was used; as air is apparently satisfactory and is the most convenient gas, it is commonly employed.

The tests, carried out on Pacific mackerel (see Table I) which had been stored at a temperature of 63·5° F., show how the results compare with the organoleptic appraisal of the foodstuff.

TABLE I

Hours Stored.	*Micro-equivalents Reduction per 5 ml. Sample of Press Juice from Raw Fish.*	*Organoleptic Evaluation of Raw Sample.*
1·5	6·2	Passable
6·0	19·1	Slight sour odour, near borderline passability
8·8	19·6	ditto
11·3	22·5	Sour odour, doubtful passability
14·8	67·0	Not passable
31·3	163·5	Not passable

It is clear that even after only six hours' storage the fish has deteriorated considerably. Whereas organoleptic evaluation can assess this only as a change from "passable" to "slight sour odour, near borderline passability," a rather nebulous description, the chemical assessment of the spoilage shows that the oxidisable volatile constituents have increased by 205 per cent.

Evidently the chemical method of detection enables the spoilage to be assessed with very much greater precision than does organoleptic testing. Furthermore, the authors of the paper describing the method state that the chemical methods enable change to be detected before the odour or flavour has noticeably changed. This is a most valuable feature of the process, and one that can well be appreciated after a study of the above figures.

In another case, examination of Bluefin Tuna was made after it had been canned. The fish had

been stored for various periods of time before being canned, and as the figures show in Table II, even relatively short times of storage have a definitely adverse effect on the quality of the fish.

TABLE II

Hours Stored before Canning.	*Micro-equivalents Reduction per 5 ml. Press Juice.*	*Organoleptic Evaluation.*
0	8·4	Passable
5·1	15·7	ditto
9·4	18·0	ditto
13·5	23·1	Doubtful passability
17·2	24·2	Not passable
21·5	34·8	ditto

It should be noted that whereas organoleptic evaluation does not distinguish between fish canned immediately and fish that has been stored for 9·4 hours, the chemical evaluation shows that in this period considerable deterioration has taken place, so that eventually after canning the stored fish has more than twice the reducing power of the fresh fish.

The method is applicable not only to fish, but also to other protein foods. Thus a round steak gave the results shown in Table III.

TABLE III

Hours Stored.	*Micro-equivalents Reduction per 5 ml. Press Juice.*	*Organoleptic Evaluation.*
11	9·1	Normal meat odour
19	10·4	ditto
26	38·8	Strong sour odour, no longer appears edible
43	49·0	Definite tainted odour
50	57·4	Foul putrid odour

In this case, also, the gradation of quality given by the chemical evaluation is susceptible to far greater precision than that given by the organoleptic test. The latter seems frequently to be in the predicament of being unable to make up its mind; the word "doubtful" occurs rather too frequently to inspire confidence.

Evidently, therefore, in the case of these protein foodstuffs, estimation of the reducing power of the volatile constituents gives a very useful indication of the condition of the foodstuff. The assessment is very much more precise than can be made by smelling and tasting, and it is claimed that differences in the condition of the foodstuff due to incipient decomposition can be detected by the chemical method much earlier than they can by the senses.

Alkaline permanganate is the oxidising agent chosen to react with the reducing volatiles. Doubtless other oxidising agents could be used, but it is stated by Lang *et al.* that alkaline is more sensitive than acid permanganate, or other oxidising agents that were tried.

Only in special cases is it yet possible to estimate the flavour of a foodstuff by physical or chemical means. Usually, when this is possible, the estimation depends on the presence of chemical unsaturation and of its oxidisability. The estimation of this factor in the "volatiles" of a foodstuff is straightforward by chemical methods. The objection to the chemical method is that it takes too long to be suitable for routine estimations. Fluorescence measurements may enable an estimate to be made of the unsaturated antioxidants.

Physical measurements which give an indication of the breakdown of large polypeptide molecules to smaller molecules may in the future be developed.

The increase in alkalinity, which is the usual accompaniment of bacterial decomposition of proteins, may also furnish a useful guide.

Whatever method of measurement is used must be extremely delicate, so that the first stages of decomposition—those that occur prior to the appearance of objectionable odours—are detectable.

REFERENCES

1. *Union of S. Africa, Dept. Agr. Forestry Sec.* Bull. **173**, 1938.
2. R. Melville. *Nature*, **154**, 640, 1944.
3. F. Munin. *Chem. Zentr.*, **1943**, I, 2155.
4. M. Pyke. *Nature*, **154**, 229-31, 1944.
5. B. Lowe and G. F. Steward. *Food Technology*, **1**, 30-8, 1947.
6. G. A. Grant and H. J. Lips. *Can. J. Research*, **24F**, 450-60, 1946.
7. J. J. J. Dingemans. *Chem. Weekblad*, **28**, 350-1, 1931; **29**, 138-40, 1932.
8. J. A. Pearce and M. W. Thistle. *Can. J. Research*, **20D**, 276-82, 1942.
9. O. W. Lang, L. Farber, C. Beck, and F. Yerman. *Ind. Eng. Chem. Anal. Edn.*, **16**, 490-4, 1944.
10. L. C. Barail. *Rayon Text. Monthly*, **27**, 663-6, 1946; **28**, 93-7, 439-43, 496-8, 1947.

New Canning Process

SHORT high-temperature methods of sterilisation produce better flavour, texture, and colour, it was stated by Dr. Martin at the 1948 Annual Food Processors' Conference held at the University of California. Moreover, they enable the canning of products, particularly semi-liquid and milk-containing foods, which cannot be preserved by former processes. After flash heating at temperatures from 250° F. to 300° F., the product is cooled rapidly without exposure, filled into sterile containers, and sealed aseptically. Filling and sealing is performed in an open system at atmospheric pressure.

Thermocouples were used throughout the study to obtain data on the effectiveness of the heating. Tests were made by inoculating the cans with heat-resistant spores, but no spoilage was detected if adequate time had been allowed for sterilisation. The capacity of the experimental machine is 60 cans per minute, but this can be increased to 300 cans per minute under commercial production.

The advantages are the improvement in quality, lower operating costs, and continuous packing; streamlined layout facilitates factory operations.

Poisoning from Honey

F. N. HOWES, D.Sc.

There has been much discussion in the past as to whether it is possible for honey, as collected from the hive and unadulterated in any way, to prove poisonous or harmful when eaten by human beings. Many are inclined to the view that as honey is a natural product and the food of the honey bee and honey bee larvae it is unlikely that it could be of a poisonous nature. It is also argued that an intelligent insect like the hive bee would instinctively avoid collecting poisonous nectar likely to harm herself or the young larvae in the hive. The inaccuracy of this view is explained by the author.

IN recent years honey in New Zealand has caused severe cases of poisoning in human beings. At the time the cause of the poisonous honey, *i.e.* the actual source of the poisonous nectar, was not known, but this was established in the scientific investigation which followed.

Consequently users and importers of New Zealand honey in Great Britain may ask themselves whether it would be possible for such honey to be imported into this country and prove toxic or harmful to the consumer here. *It would seem, however, that this is most improbable.*

Poisonous Honey in Classical Times

Poisoning from honey in Eastern Europe dates from classical times, for Xenophon's soldiers suffered from it during the retreat of the Ten Thousand while encamped at Trebizond on the shores of the Black Sea in 400 B.C. Xenophon gives a description of the effect of the honey on his soldiers, and states that those who had eaten it lost their senses, vomited, and were affected with purging. The soldiers who had eaten but little appeared merely intoxicated, while those who had eaten much were "like mad men." It is generally supposed that the honey was derived from Rhododendron (*R. ponticum* L.).

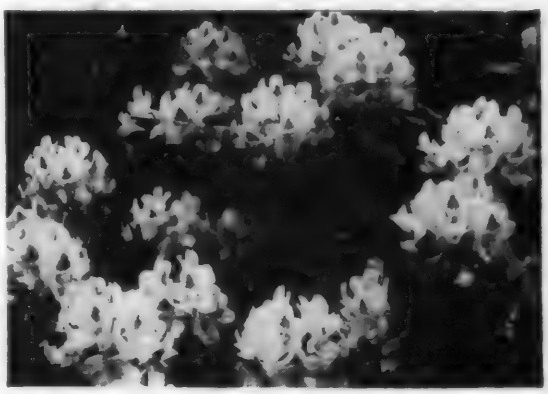
There have been other accounts of honey poisoning in this and neighbouring regions considered to be due to Rhododendron.

A more recent account of honey poisoning attributed to species of Rhododendron is one that has been given by Kingdon Ward in "A Plant Hunter's Paradise." At a village in Upper Burma near Tibet honey brought in by the headman (in early May) affected two members of the party, causing one to collapse suddenly. However, the symptoms, which were described as resembling acute alcoholic poisoning, soon passed. The honey in question was considered to be derived from local Rhododendrons. It would seem, therefore, that other Rhododendrons, besides the common Pontic Rhododendron, may be responsible for honey poisoning.

According to a Russian (Mosolevsky, *Bee World*, 1929, p. 141; 1942, p. 31) poisoning from Rhododendron honey in some districts of the Caucasus is in evidence as soon as the consumption of the first comb honey of the season commences. It takes place to some extent every year, but is more pronounced in dry seasons than in wet. The first symptoms generally arise three or four hours after eating. Fatal cases with it occur mostly among children. This may be due to the tendency for children to consume more honey per unit of body weight than do adults. In general, the most frequent references to honey reputed to be poisonous relate to areas round the Black and Caspian Seas.

Poisonous Honey in Britain?

In many parts of Britain the Pontic Rhododendron is freely cultivated and naturalised. It is interesting to record, therefore, that it has been suspected of being the cause of unwholesome honey in this country on a few occasions. Normally the flowers are not worked to any extent for nectar by the honey bee in Britain, although much frequented



Poisoning from honey derived from certain Rhododendrons is well known, especially in parts of eastern Europe.

Some of the North American "laurels" (species of "Kalmia") are suspected as sources of poisonous honey.

by bumble bees that are probably better able to reach the nectar with their much longer tongues. Probably when conditions are particularly favourable for nectar secretion honey bees obtain a certain amount of nectar.

According to one authority a sample of honey from Cobham, Kent, examined by him and alleged to be from Rhododendron, was found to have emetic properties by all who partook of it. In another instance at Camberley, Surrey, when new comb honey was eaten for breakfast, symptoms of poisoning were experienced. Not all the members of the family who had eaten the honey from the same comb were affected. The supposition was that possibly only some cells of the comb contained the poisonous honey. Numerous Rhododendrons grew in the vicinity.

Poisoning in Japan

In Japan a shrub (*Tripetaleia paniculata*) is the source of unwholesome honey in mountain districts, where it may occur in abundance. The honey is said to have a pungent taste and the severity of the poisoning to vary with different individuals.

The United States

In North America several different species have been suspected of being the cause of honey poisoning. These include the Calico Bush or Mountain Laurel (*Kalmia latifolia*), Yellow Jasmine (*Gelsemium sempervirens*), and possibly species of *Pieris*, *Andromeda*, and *Leucothoë*. In regions where the Mountain Laurel is common in the eastern United States, farmers and beekeepers have been known first to feed to the dog honey which they looked upon with suspicion. If no ill-effects were noted within a few hours children and other members of the family were allowed to have the honey. As far back as 1875 a Dr. Grammer, who had been a surgeon in the Confederate Army, stated in an American beekeeping journal: "Wherever the Mountain Laurel grows the bees are very fond of it. . . . It is dangerous for anyone unable to detect the taste to eat the honey. It has a highly poisonous effect, being an extremely distressing narcotic, varying in its effects in proportion to the quantity eaten. During the war I had many opportunities of witnessing its effects, and on one occasion personal experience gave me the right to say that I know something about it. . . . Some time after eating a queerish sensation of tingling all over, indistinct vision, caused by dilation of the pupils, with an empty, dizzy feeling about the head and a horrible nausea which would not relieve itself by vomiting.

"The first case or two that I saw were entirely overpowered by it, and their appearance was exactly as if they were dead drunk . . . the enervation of all the voluntary muscles was completely destroyed. The usual remedies for narcotics partially restored them in a few hours, but the effects did not completely wear off for two or three days, and I was assured that fatal consequences have been known to follow a too free indulgence."

There has been much difference of opinion regarding the poisonous nature of the honey of the American Yellow Jasmine. One writer attributes fatal consequences to honey derived from this source at Branchville, South Carolina, and states: "A boy eleven years old was the first of the family to eat some of the honey. In an hour afterwards the child became giddy and staggered as he walked, and could not see. He was affected with general lassitude and slight nausea. In two hours he was seized with convulsions and died. The honey was given to a negro woman who gave it to her children. In one hour two of these children died after an attack of dizziness, blindness, and nausea. Several other persons who ate the honey were made sick in similar manner but vomited, and thus escaped fatal consequences."

The Yellow Jasmine, whose fragrant yellow

There appears to be no record of honey from limes being poisonous to human beings.

flowers appear in the spring, is known to be poisonous and to be the cause of death in livestock.

The plants so far mentioned, with the exception of *Gelsemium*, are all members of the heath family (*Ericaceae*), which is a significant and interesting point. However, other members of the family are known to be good honey sources, and honey derived from them has never been held suspect. Good examples are the common heather or ling (*Calluna vulgaris*), the source of the much esteemed heather honey of Scotland and an important honey plant in several western European countries; also various other heaths which are also sources of honey.

The statement is often made that where honey proves poisonous or unwholesome this applies only if the honey in the comb is eaten in the "unripe" or uncapped state, and that once the cells are capped over by the bees and the honey properly ripened in the hive it ceases to be injurious. From the general evidence available it would seem that this may well be so with poisonous honey from Rhododendron, but doubtless it does not apply in all instances.

Outbreaks in New Zealand

The outbreak of honey poisoning in New Zealand, already referred to, has been recorded and investigated by Palmer Jones and others. It occurred at Pongakawa, in the Bay of Plenty district, North Island, in 1945. The honey responsible for the poisoning was from a single apiary of some fifteen hives situated approximately ten miles from Pongakawa and twenty-five miles from Te Puko. All the toxic honey was from the last extraction of the season, obtained in February, amounting to some 200 lb. It was thoroughly mixed before being drawn off into containers. Fortunately much of the honey was retrieved and served as a basis for investigation. The persons who ate the honey suffered from vomiting, unconsciousness, and abdominal pains. Temporary loss of memory also occurred in several instances.

Observations on the vegetation in the immediate neighbourhood of the apiary from which the poisonous honey had been obtained showed that the small tree or shrub known as "Tutu" (*Coriaria arborea*) was very prevalent. The latter, being known to be a plant poisonous to livestock, was regarded with suspicion. Bees were known to collect pollen from the flowers, but examination of the flowers showed that they were without nectaries and therefore always devoid of nectar. They could not, therefore, be a source of honey. Tests carried out with the pollen showed that it was entirely without toxic properties.

However, further observation showed that the leaves of "Tutu" were sometimes covered with honeydew, due to the activities of a small insect, the vine hopper, *Scolypopa australis*, and that hive

The floribunda shrub, a member of the species "Pieris" found in North America, is also suspected of causing honey poisoning.

bees were sometimes known to collect this honeydew, particularly during hot weather when floral nectar from other plants was absent or scarce. An extract of the honeydew dosed to guinea pigs proved toxic, although honey bees were able to harvest the toxic honeydew without being adversely affected themselves. The honey stored in the hive from bees collecting honeydew from "Tutu" was described as of a light amber colour and of a sticky consistency. It appeared to have no outstanding peculiarity that would enable beekeepers to identify it when stored in the combs.

In New Zealand when the weather is dry and there is heavy infestation by the leaf hopper, honeydew may be produced very freely and cover all the leaves on the secondary branches. Sometimes the viscosity of the honeydew is so thick as to be considered rather unavailable to bees, but at other times it is of a watery consistency and readily drips on to the leaves below or on to the leaves of other plants. It may remain for some time in such a condition as would be suitable for the feeding of bees. In other countries, including the British Isles, honeydew is common in dry summers and is collected by bees. It is a nuisance to beekeepers, for it spoils the flavour of other honey. It has never been suspected of being poisonous in Britain as far as the author is aware.

Nature of the Poisonous Property

Feeding tests with the poisonous "Tutu" honey were carried out on various animals in New Zealand. It was found that pigs, sheep, rabbits, mice, and bees were not susceptible to it. Rats were only slightly affected, but guinea pigs were very susceptible; these were therefore used in studying symptoms and following the course of chemical extractions.

At first it was thought that the honey owed its poisonous property to the presence of the same substance that causes poisoning in livestock that

(*Concluded on page* 462)

Surveyors and Purveyors, 1949

Two recent books supply useful information about new methods of research and fact-finding. Neither of them deals specifically with commercial market research, but some general acquaintance with modern social study is essential before its more specialised aspects can be understood. One of these books* is a technical and historical account of social surveying. The other† is of a more general nature, and, indeed, is not intended to be significantly technical; it is a survey of the middle classes of England and their changing fortunes. But the two authors make much use—especially in studying the middle classes of these post-war years—of the results of social surveys.

Social Surveying

It might be said that neither of these books seems to be of much practical value to the manufacturer. It is true that they are not books to keep on the most accessible shelf of his reference library; but they are certainly books that deserve a single reading. The former will give him a clear insight into the basic methods and principles of social surveying, and the technique to be followed before reliable data can be obtained. It is a little regrettable that the author did not actually include a chapter upon market research for commercial purposes.

Middle-class Opinion

The latter book about the middle classes is essentially realistic and delightfully readable, and, after all, there are few manufacturers of shop-sold products who are not primarily dependent upon middle-class opinion. Fashions in ladies' clothes may be made in Bond Street, but "fashion" in food products is solidly formed in the London suburb and the provincial city. The working classes may be more numerous, but, inasmuch as their relative purchasing power permits (and today that word "relative" can often be taken to mean "equal" or even "greater" rather than "lesser"), they will usually follow the lead given by middle-class shoppers. To know these intimately is to know most of the market, and no book has yet presented these classes as profoundly and accurately as this study.

Of particular importance is the analysis of post-war changes in the economic position of the middle classes, and the twelfth chapter provides a number of income and expenditure surveys. Various figures for the percentages of incomes spent upon food (comparing pre-1939 with post-1946 data) are given. It may surprise many people to learn that a survey of two middle-class income groups (£250 to £700 and £700 to £2,000) showed that the 1938 and 1947 percentages of income spent upon food were almost the same in both cases; for the lower income range, 24·4 per cent. and 24·1 per cent., and for the higher range, 15·8 per cent. and 15·4 per cent.

Food Expenditure

One aspect of food expenditure has risen sharply, however, for the £250 to £700 income range; this is the percentage of income spent upon "lunches out"—3·9 per cent. in 1947 against 1·4 per cent. in 1938. For the £700 to £2,000 group the percentage remained unchanged at 2·4 per cent. in both 1938 and 1947. One point emerges clearly from these middle-class budget surveys. The expenditure item which has risen grossly is income tax, and there is little room in any of the 1947 budgets for appreciable adjustments of expenditure; if more food were available, or if it were dearer in price, it is hard to see how greater proportions of middle-class incomes could be spent upon food unless there was easement of the taxation burden. There is exceedingly little prospect of economy in the other classes of expenditure.

A final word about the first of these books. Among the various cases of surveys discussed in detail will be found Boyd Orr's pre-war survey of nutrition, and also the Ministry of Labour's 1937-1938 standard of living survey. Considerable attention is given to Mr. B. Seebohm Rowntree's surveys of York in 1899 and 1936. All these have connexions of one kind or another with the subject of food; indeed, perhaps the really notable connexion is the most indirect one—that a pioneer worker in this field was a member of one of England's best known food manufacturing families.—D. P. H.

* *Social Surveys.* By D. Caradog Jones. Pp. 232. Hutchinson's University Library, London. Price 7s. 6d. net.

† *The English Middle Classes.* By Roy Lewis and Angus Maude. Pp. 320. Phoenix House, London. Price 15s. net.

Poisoning from Honey

(*Concluded from page* 461)

have grazed "Tutu," *i.e.* tutin. However, investigation showed that another substance, extracted as a crystalline material, which the investigators termed mellitoxin, was in the main responsible for the toxicity in the honey. Combustion analysis and a molecular weight estimation indicated the molecular formula to be $C_{15}H_{18}O_7$. The substance was regarded as one of the picrotoxin class of poisons, although its precise chemical nature has yet to be worked out.

BIBLIOGRAPHY

Herrod-Hempsall, W. "Beekeeping New and Old."
Howes, F. N. "Plants and Beekeeping."
Palmer-Jones, T., Sutherland, M. D., Paterson, C. R., Harris, W. F., Filmer, D. W. "A Recent Outbreak of Honey Poisoning," *New Zealand Journ. Sci.*, Vol. 29, October, 1947.
Pellett, F. C. "American Honey Plants." 4th Edition.

First National Packaging Exhibition

LATEST DEVELOPMENTS IN MACHINERY AND MATERIALS

To be held in the City Hall, Manchester, from October 5 to 15, the First National Packaging Exhibition will enable manufacturers in all industries to see the new materials and processes which are becoming available for the better and more economical presentation and despatch of their products.

In addition to exhibits by package suppliers, displays of educational value will be included; on stands 78, 79, and 80 in the Tonman Hall the Institute of Packaging, who are sponsoring the Exhibition, will present a packaging story tracing the progress of a package and its contents from inception to safe arrival in the customer's hands.

An enquiry office will be available just inside the main entrance to deal with problems of overseas and other visitors.

The official opening will be performed at 2 p.m. on October 5 by Sir Robert Sinclair, K.C.B., K.B.E., President of the Federation of British Industries, and the chair will be taken by Mr. G. M. Ashwell, President of the Institute of Packaging. Subsequent to the opening day, the Exhibition will be open daily from 10.30 a.m. to 7 p.m.

MAIN HALL

Adhesive Tapes

A new industrial model "B" dispenser, together with an extension plate designed to assist the sealing of Cellophane and paper bags, and small tins and jars, will be on view for the first time on Stand 19, where Gordon and Gotch are exhibiting.

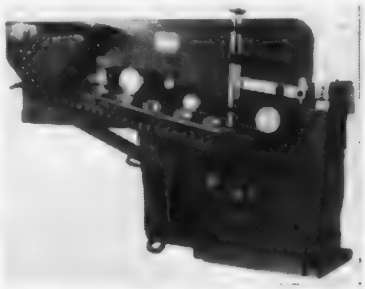
New industrial model for dispensing adhesive tape.

Photographs and actual examples of tins, jars, and other sealed packs will illustrate the varied packaging uses of Sellotape, a self-adhesive cellulose tape, while its use as a display item will be shown by its incorporation in the design of the stand. Printed and coloured versions of the tape will also be featured, together with Collotape, a self-adhesive cloth tape.

*

Labelling Machinery

Capable of handling vials, ampoules, and other small cylindrical objects, the new fully automatic labelling machine made by D. Trapow and Co. is being demonstrated on Stand 41. The use of this machine, which has an output of up to 200 dozen bottles per hour, enables labels to be affixed completely around containers or to be overlapped in accordance with the size of both labels and containers. Ampoules are fed from an inclined hopper from which they are delivered to the labelling position along an inclined plane. After the label has been transferred from the gumplate to the container, it is pressed to the latter by rolling it along a sponge rubber pad, the bottles being rotated by a belt.



*

Closures for Metal Containers

Two innovations of interest to the metal container industry will be seen on Stands 8, 9, and 10. Reads' new closure for drums and tins consists of a neck incorporating a flexible, polythene plastic pouring spout. Made from Alkathene, the concealed spout permits controlled pouring; it is pulled out with the fingers from within the neck when required and can be pushed back to the level of the neck after use. Fully tamper-proof and leakproof, it can be affixed in one unit by the packer after filling.

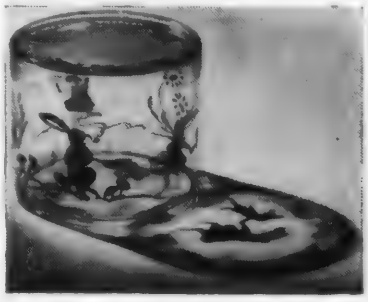
The company are also introducing their E.R. patented interrupted-chimb drum. In this new method of construction, the flange of the top stamping is folded back on to itself so that when the top of the drum is double-seamed to the body, there result two thicknesses of steel inside the four thicknesses of the lock.

A double-secure A.G. pattern hoop closure and locked-seam drum with pressed-out roller hoops, as well as colour-printed and decorated tins and boxes and a display of the Ringseal patented pilfer-proof tins and necks with pourer spouts, will also be seen.

*

Packaging Pockets

Specimens of their embossed seals, plastic containers, adhesive tapes, transparent bags, wrappings, and containers will be shown by John Dickinson and Co. on Stand 50. Prepackers will be interested in the company's envelope pockets, made in a wide range of sizes and styles. Particularly suitable for use with automatic filling and sealing machines, each pocket is a precision made unit, regular in size and shape with clean cut edges. The pockets can be printed by letterpress, gravure, or lithography, thus acting as pictorial advertisements.



A transparent cellulose acetate box printed in two colours.

Adhesives

A wide range of vegetable and synthetic adhesives made by National Adhesives for the package maker and user will be seen on Stand 11.

These will include grades for carton, box, and bag making, and for labelling, wrapping, and sealing the finished package. Adhesives for all modern packaging materials will be featured.

It is hoped to show specimens of packages on which these adhesives have been used.

*

Packaging Aids

The complete range of their Gumstrip sealing machines, including the Rodney automatic (moisture controlled), and the new tape-shooter sealing machine specially designed for securing large and heavy bales, giving 86 in. strips of tape ready moistened, will be on view on Samuel Jones and Co.'s Stand 34. Balestrip streamline tape and methods of bale packing will also be shown, together with specimens of selected printed Gumstrip sealing tapes.

Noncurling gummed papers for labelling and Devonvale coated papers and boards will be on display as well as a labeller for moistening parcel labels.

Waterproof wrapping papers, self-adhesive sealing tapes in paper, cloth, and cellulose, and many other aids to both packaging and packing will be seen on this stand.

*

Protective Wrappings

Visitors to Stand 49 will see a comprehensive display of the many uses of Pliofilm, produced by the Goodyear Tyre and Rubber Co. (Great Britain), as a protective wrapping for a diversity of foods, metal tools, medical supplies, and many other commodities which demand moisture protection.

Examples will be shown of the film laminated to foil, paper, cardboard, and other packaging materials for special purpose packs, while its sales-appeal will be demonstrated in the display of packs printed in colours direct on to the material.

Of special interest will be demonstrations of Pliofilm bag making and of skin-tight packaging, especially of irregular shapes, by stretch wrapping.

The many packaging uses of Alkathene film and lay-flat tube will be featured by the Plastics Division of Imperial Chemical Industries on Stand 48. A varied selection of products wrapped in the film will be shown, as well as special displays demonstrating the use of this new material for packaging deep-frozen foodstuffs, and methods of heat-sealing.

Lay-flat tubes and the polythene moulding powder from which they are made.

The transparent film is resistant to water, water vapour, and chemical action, and remains flexible down to temperatures as low as −60° C.

*

Cartons and Containers

The self-service shop of the future forms a novel background to the products that Brown, Bibby and Gregory are exhibiting on Stand 24. The buyer will be able to see and handle all types of packages under the conditions for which they were designed. These include rigid paper containers, cartons, flexible packaging, all types of paper bags and wrappers, transparent film and foil wrappings, and a wide range of can and bottle labels, printed in litho, letterpress, and four-colour gravure.

The display of self-opening satchels will interest users of automatic packaging machines. It will show how products can be packed into a satchel bag container as rapidly as into a carton, and also how these bags can be lined with another type of paper or transparent film, and can be printed in up to four colours.

"Almost anything for packaging almost everything" will be the theme of Stand 16. Containers and rigid boxes, cartons and fancy boxes, machine-made and hand-made bags of all types, spirally wound tubes and canisters, waxed papers, coloured wrapping papers, lithograph and letterpress labels are among the range of products that C. Davidson and Sons are exhibiting. A working model will demonstrate the waterproof qualities of Ibeco kraft paper, which is made in various weights and has application in a wide range of industries, while display panels will show photographs of some of the departments in the company's factories.

*

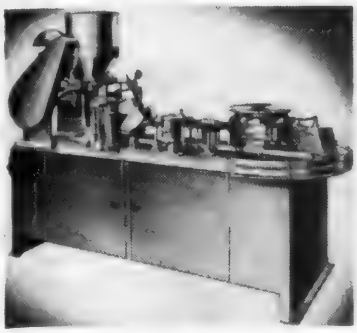
Net Weighing Machine

The exhibit on Stand 14 will consist of a single unit installation of the Hy-tra-lec automatic weighing and filling machine. Manufactured by Industrial Products (Speco), this machine is suitable for weighing free-flowing and semi-free-flowing dry products for packaging in almost all types of containers having a net weight content of from ½ oz. to 2½ oz. The "positive displacement" principle incorporated in the machine eliminates human error and minimises reaction to varying temperature. Other models for greater weights are also produced.

NEW HALL

Weighing and Packing Machines

An Autopacker for handling pint packets of custard powder, gelatine, etc., which automatically feeds envelopes or bags from a magazine, opens and fills them with an exact quantity of material, gums, and seals them, at a speed of sixty to seventy per minute will be seen on Stand 98. A range of automatic precision weighing machines, including a double beam type high speed machine for weighing quarter pounds of tea which can be arranged to work up to twenty-eight weighings per minute with a maximum variation of two grains, is also being shown by The



Automatic packing machine for handling such products as custard powder and gelatine.

Automatic Weighing and Packing Machine Co. Other exhibits are a completely automatic ampoule filling and sealing machine and one for the overwrapping and heat sealing of square or rectangular packs with Cellophane.

*

Folding and Rigid Boxes

Special prominence on Stand 90 will be given to the Velvetone process for producing folding boxes with outstanding printing effects. A wide range of folding and rigid boxes made by advanced methods will be on view and a feature will be made of Hunt Partners' moulded acetate packs — visual packages moulded to the individual product. Attractive showcards, also produced by the same methods, will be of interest to manufacturers of bottled lines.

*

Pilfer-proof Seals

Demonstrations of the "rolled on" method of sealing for screw top bottles or jars will be given on Stand 89 where Metal Closures are exhibiting. The R.O. seals are "tailor-made" to suit each individual bottle or jar and are available in a wide range of sizes, either plain or pilfer-proof. Once rolled on to the bottle, the seal cannot be unscrewed without fracturing the "bridges" on the perforation, thus revealing that the closure has been removed. The seal is claimed to be ideal for packs which require pasteurising or sterilising after closing and a wide range of products using R.O. seals will be displayed.

The range of sealing machines for hand, semi-automatic, or fully automatic operation, applying seals at various speeds, also includes models for vacuum sealing, and various types of these machines will be shown in operation.

TONMAN HALL

Packaging Research

The work of the Association under the headings of research, advisory service, information service, and package testing is to be demonstrated on Stand 76 by the Printing, Packaging and Allied Trades Research Association. Exhibits will illustrate research work on the protective qualities of packaging materials against mechanical damage, atmospheric conditions, etc.

A working laboratory will be shown at the Exhibition and there will be demonstrations of the routine testing of materials and of the mechanical testing of packages. An impact test, a drop test, and a compression test are used on packages. The latter also undergo strength tests in a specially constructed wheel, the number of impacts given being recorded on a dial at the base of the wheel. Tensile, burst, and puncture tests are used on packaging materials. The permeability of packages to water vapour, gases, and liquids, and the protection against damage by insects and moulds which they afford are also determined. Visitors will be able to consult members of the staff who will be present to explain the work of the Association.

A range of screw top bottles and jars incorporating R.O. seals.

Packages undergo strength tests in a specially constructed wheel.

Protecting Goods in Transit

An office, enquiry counter, and photographic display will comprise the British Railways' exhibit on Stand 74 which is aimed at demonstrating the best and most economical way to protect goods from damage in transit.

The office is being provided for private discussions with railway representatives on problems arising in connexion with the packaging of goods for transport.

Adjoining the office will be an enquiry counter where information regarding passenger and freight train services, and advice with regard to the packaging, labelling, and addressing of goods, from a small parcel to a wagon-load, will be given.

Photographs will be exhibited in a novel display frame which takes the form of a book; the leaves will contain illustrations of various types of railway wagons and containers with specific emphasis on the correct methods of packing.

A special folder has been prepared for free distribution at the exhibition giving hints on how to prepare goods for transport.

*

Packaging Institute Dinner

To coincide with the Exhibition, the Northern Branch of the Institute of Packaging is holding its second annual dinner at the Grand Hotel, Manchester, on October 12.

News from the Industry

FORTHCOMING EVENTS

Institution of Works Managers

A great increase in membership since September 1947 is mentioned by the chairman in his foreword to the third programme booklet of the Institution of Works Managers. An increasing proportion of members are reading papers at branch meetings and he appeals for still more members to do so, thus promoting a wide exchange of information on works management problems.

Branches may be opened in Cardiff, Newcastle, Nottingham, and Preston in March, 1950, and groups will probably be formed in fourteen centres in 1949-1950.

The second national conference will be held at the Prince of Wales Hotel, Harrogate, from October 7 to 9, 1949, the theme being "Producing better goods at lower cost."

The annual general meeting will be held at the Royal Society of Arts on October 28 at 7 p.m.

Forthcoming meetings of the London branch, held at 6.45 p.m. at the Royal Society of Arts, are as follows:

October 4. "Reduce your Overheads." L. C. Ord, Lewis Ord and Partners.
October 18. "Problems of British Industry Today." L. C. Ord.
November 2. "Industrial Psychology." Mrs. W. Raphael, National Institute of Industrial Psychology.
December 6. Discussion.

*

Scientific Film Congress

The Third International Scientific Film Congress is being held in Brussels from September 30 to October 5, 1949. During the Congress, delegations from many countries will meet to discuss progress on various subjects of importance in relation to the international aspect of scientific films. Sub-Committees will be presenting reports on such projects as the establishment of a standard method for cataloguing and recording information about scientific films, and on customs regulations in relation to the international exchange of scientific films.

In conjunction with the Congress, there will be a Scientific Film Festival. This will include four public sessions dealing with research, education, and scientific documentary films; the fourth show will consist of general scientific films. There will be a screening of medical films, but the audience will be restricted to those with medical interests.

In addition to the public shows, there will be four sessions intended for specialists; these will cover the fields of research, education, industry, and medicine.

*

Royal Sanitary Institute

Meetings arranged by the Royal Sanitary Institute are as follows:

Benjamin Ward Richardson Lecture. November 9, at 2.30 p.m. at the Institute. "The Australian Meat Export Industry and Long-distance Transport of Chilled Beef," by R. H. Heywood, B.V.Sc., Acting London Representative and Executive Officer, Australian Meat Board, and Acting Commonwealth Veterinary Officer to the High Commissioner for Australia. Chairman: Sir Weldon Dalrymple-Champneys, Bt., D.M., F.R.C.P. (Chairman of Council).

Huddersfield Sessional Meeting. November 11, at approx. 10 a.m. in the Lecture Room, Technical College. Papers on "Further Experiments with Synthetic Detergents particularly with respect to their effect on Percolating Beds," by H. H. Goldthorpe, D.Sc., A.R.I.C., F.Inst.S.P., chemist and manager, Sewage Works Department, Huddersfield, and J. Nixon, Ph.D., A.M.Inst.S.P., and "Recent Regulations relating to Milk," by John M. Gibson, B.A., M.D., D.P.H., Medical Officer of Health, Huddersfield. In the afternoon visits will be paid to the sewage works and the new Dingley reservoir. Chairman: J. B. Thomson, M.I.C.E., M.I.Mun.E., A.R.I.C.S. (Chairman-Elect of Council).

London Sessional Meeting. November 18, at 2.30 p.m. at the Institute. Discussion on "The New Milk (Special Designations) Regulations," to be opened by W. A. Lethem, M.C., M.D., D.P.H., Principal Medical Officer, Ministry of Food. Chairman: Dr. Thomas Orr (Vice-President).

London Sessional Meeting. December 14, at 2.30 p.m. at the Institute. Discussion on "Tuberculosis Infection and the Use of B.C.G.," to be opened by Frederick Heaf, M.A., M.D., F.R.C.P., M.R.C.S., Adviser in Tuberculosis, Ministry of Health, Senior Medical Officer, London County Council.

Refresher Course for Engineers

In order to promote the application of up-to-date techniques in factory engineering practice over a wide field, with emphasis on the economic aspects of the conservation of heat and energy, a refresher course for works and plant engineers has been organised by the South Western Region of the Incorporated Plant Engineers.

The course will comprise twenty-six addresses given by specialists in each field. There is to be a two-hour evening session each week: the address will be given in the first hour, the second hour being devoted to discussion.

The course, which will commence in mid-October, will be held by the Bristol College of Technology in collaboration with the University of Bristol. Full details can be obtained from the secretary to the course, 12-14, Apsley Road, Clifton, Bristol, 8.

*

Safety Conference

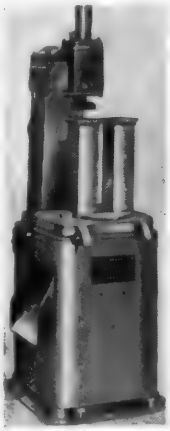
The safe use of solvents, the installation and maintenance of breathing apparatus, and the use of electrical apparatus in hazardous atmospheres are among the subjects to be discussed at a residential conference to be held at the Royal Hotel, Scarborough, from October 7 to 9.

Organised, on behalf of the Association of British Chemical Manufacturers, by the Royal Society for the Prevention of Accidents, the meeting will be on the same lines as the Society's own Scarborough conferences and the previous chemical safety conference held last year at Harrogate.

Sir Harry Jephcott, of Glaxo Laboratories, will open the conference, and other speakers will include Dr. A. J. Amor, President of the Association of Industrial Medical Officers, Mr. T. Senior, of I.C.I., and Mr. S. W. Richards, of the G.E.C.

The programme includes a Brains Trust at which Mr. H. R. Payne, chairman of the Works Safety Committee of the A.B.C.M., will be question master and at which one of the experts will be Mr. H. G. Winbolt, formerly director of the Industrial Safety Division of R.S.P.A.

Automatic Machines for Packers



With an output of approximately five tons per working day of eight hours, the Robust high speed meat and food dicing machine cuts in regular cubes, slices, and strips all kinds of vegetables, fruit and their peels, fish, raw and cooked meat, including hog's flake, frozen meat, and whale meat. Any size of cube up to 1 in. can be arranged, while the machine strips and slices in grades down to standards required by preservers.

Any type of screw cap—metal or plastic, plain or moulded—as well as screw stoppers can be handled by the automatic cap screwing and tightening machine. Adjustment from one container to another is made by wing screws accessibly mounted at the front of the machine. With two operators, one dropping the caps on the containers, and the other feeding the machine, 25,000 containers can be handled in eight hours.

Other machines made by Richard Brandt and Co. include the Econom double seaming machine, a small hand-operated machine for double seaming round tins up to 4½ in. circumference and up to 7 in. or 9 in. high, and the Record machine for filling thick or thin liquids, creams, and pastes into any type of container, and for jellying pies.

Quick Freezing on a Jobbing Basis

Quick freezing has been adopted to some extent by the fish trade in the north-east of Scotland and the east of England, and there is now evidence that Glasgow fish merchants are becoming interested.

At present there is a certain amount of quick freezing of kippers in Glasgow, but for this purpose the kippering firms seek the co-operation of the cold storage companies, thus avoiding the need to install individual plants.

By this method the kipperer passes his reserves to the cold storage firm, where they are quick frozen and held under sub-zero conditions until the owner asks for delivery. Under this system the kippers have virtually thawed by the time they reach the retail outlet and are thus in excellent condition for sale. The success of the system encourages the belief that fuller use could be made of such cold storage facilities where the store is prepared to operate on a jobbing basis.

Potato crisp weigher with an output of approximately 1,000 crisps per hour.

Potato Crisp Weigher

The tendency of potato crisps to join and stick in a normal type of hopper has been overcome by the development of an automatic weigher and filler. With this improved hopper an even feed to the weighing apparatus is obtained, regardless of the regularity or otherwise of the feed to the hopper, thus producing accurate weighings at a consistent speed. Feeding is by electric vibrator, and the machine hopper can be fed by hand or by conveyor.

The new weigher, produced by Valley Products (Lye), has an output of approximately 1,000 crisps per hour.

Paint Transfers

Industrial markings, trade names on vehicles and machinery, marks for bulk containers, and advertising are a few of the many uses to which the three types of Trapinex transfers — slide-off, sandwich, and double-sided — can be put. The paint transfers can be supplied in any size from ¼ in. square to sections measuring 25 in. × 30 in. which can be made up into large designs.

For all normal purposes the paints are standard, giving guaranteed weather fastness, and possessing exceptional endurance under all conditions of climate or usage.

Trimming and Beading Machines

Designed for all kinds of trimming, beading, flanging, knurling, swaging, necking, crimping, and curling operations on round articles, the "Besco" 280 and 281 models are new additions to the range of machinery produced by F. J. Edwards. Arranged for hand feed, the design is very compact with the vee rope motor drive built in and a flush mounted push button control and separate starter switch on the front of the body. An exterior adjustment is situated at the back for tensioning the vee belts. The gears, which give a range of three speeds to the top spindle, are totally enclosed in the head, the changing of speed being effected by the necessary change wheels supplied. Pressure on the top roll is controlled by the spring-balanced handle giving smooth, positive action, the throw being adjusted by means of the screwed rod and locknuts to suit the particular work being performed. Both the top and bottom spindles are adjustable in the lateral plane by means of the locking rings under the gear cover.

The lower spindle has an additional adjustment, the whole spindle being permitted to slide in its bed, and is secured by locking screws in the desired position.

Aluminium Containers for Gluten

Incorporating a number of improved features, a new 5-gallon aluminium container has been developed after considerable research by Procea Products for the packing and distribution of their hydrated gluten.

A new ball-type valve in the lid prevents escape of brine in which the gluten is packed and ensures that bakers receive their supplies in the best possible condition. Tinplate containers previously employed had a tendency to rust and suffer damage in transit.

Made by the Warwick Production Co., the new containers are stamped from 10-gauge aluminium with smooth curves and no crevices in order to facilitate cleaning. The lid is fitted with a rubber sealing ring, making a liquid-tight joint when secured by the three clips.

Container bottoms and lids are radiused to fit, thus facilitating stacking. Handles lie flat against the side of the container when stacked and a small frame riveted under one handle accommodates a removable address label. On the sides are labels showing the familiar Procea bakerman trademark and bearing instructions for the storage of the gluten.

Packaging Papers

By laminating aluminium foil with papers and other materials, Carr and Co. have produced a waterproof wrapping for packaging confectionery and other products.

Duplex, triplex, and multi-ply bituminised papers and boards, which are also made in jute-inserted or hessian-lined varieties for greater strength, or crêped for greater pliability, are other examples of "Carco" waterproof protective packaging papers.

Waxed tissues, parchments, krafts, and crêpe krafts are sold in reels, sheets, coils, and strips, or made up into bags and case liners, and these can be printed by the company in up to four colours according to requirements. Other products include corrugated gummed paper tape, and untreated krafts, tissues, browns, etc.

Electric Floor Scrubber

All those responsible for the cleaning of large floor areas will be interested in a machine by means of which a floor can be scrubbed, washed, wiped, and dried at the rate of 3,000 sq. ft.

per hour. Powered by a ½ h.p. electric motor, the Simon scrubber, which is manufactured by Morphy-Richards, can be used on any type of floor surface and requires to be passed over the floor only once to perform its four-fold operation. The principle employed is that of using scrubbing brushes, detergent solution, and wiping cloths, with the added advantage of electric power.

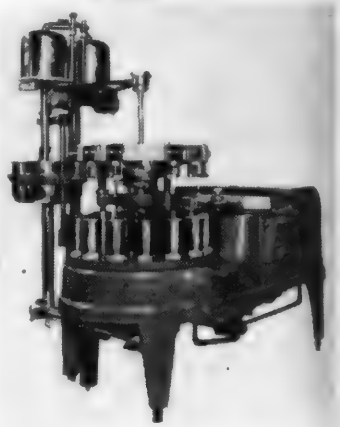
The machine, which is a heavy duty industrial type of equipment weighing 200 lb. and measuring approximately 2 cu. ft., is finished in stoved enamel with chrome fittings. It is self-contained, requiring no auxiliary water tanks or other equipment.

Filling and Stopper Pressing Machines

Capable of filling sauces, salad cream, meat essences, and other food products into a wide range of bottles at a speed of up to 100 bottles per minute, the Albro fifteen head rotary high vacuum operated filling machine is a completely self-contained unit, incorporating a vacuum pump and drive. Every bottle is filled to a uniform and accurate level and is left perfectly clean after filling, ready for immediate capping. The machine, which is adjustable for various heights and shapes of bottles and filling levels, is provided with a variable speed adjustment to give any required output. An adjustable vacuum enables the handling of liquids of various viscosities. Ten head and twenty-four head types are also made for outputs of up to 7,200 bottles per hour.

A flexible and efficient unit is the four head straight line semi-automatic filling machine which is also adjustable and completely self-contained. Usually constructed throughout in stainless steel where in contact with the product, the machine is available in ebonite construction incorporating a rubber-covered steel tank for handling bleach and various types of acids.

The company's combined conveyor and stopper pressing machine may be used either for pressing corks or glass stoppers into filled bottles or for pressing in lever lids on tins. The unit is fitted with a ½ h.p. motor drive, the whole frame being mounted on wheels for mobility.



Exams. in Sales Management

In order to meet the demands of students, the Education Committee of The Incorporated Sales Managers' Association are holding qualifying and final examinations in "Sales Management" in London and various provincial centres on Thursday, Friday, and Saturday, December 1, 2, and 3, 1949.

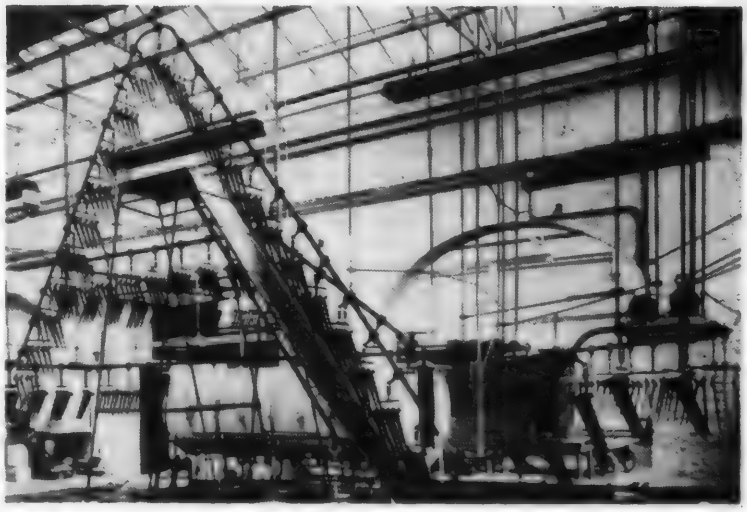
Entry forms and syllabus of examination may be obtained from: The Secretary, I.S.M.A., 23, Bedford Square, London, W.C.1. Closing date for entries will be October 29, 1949.

Shark Fishing in Scottish Waters

Shark fishing is again being carried on in the west of Scotland waters this year with fairly good results. Shark hunting in this area began in 1938 but was interrupted by the war when attention was switched to herring fishing.

After the war Scottish West Coast Fisheries equipped a 100-ton steam unit to undertake fishing off the Hebrides and the Ayrshire coast. Catchers are 14-ton fishing boats, specially equipped and operating from the parent ship, with which they have radio contact.

Shark liver oil is in strong demand at present, and a ready market is being found for all the oil obtained. The carcasses are processed into fish meal.



The standard Teleflex conveyor, which is capable of handling maximum loads of 75 lb. per carrier, is light and flexible in construction.

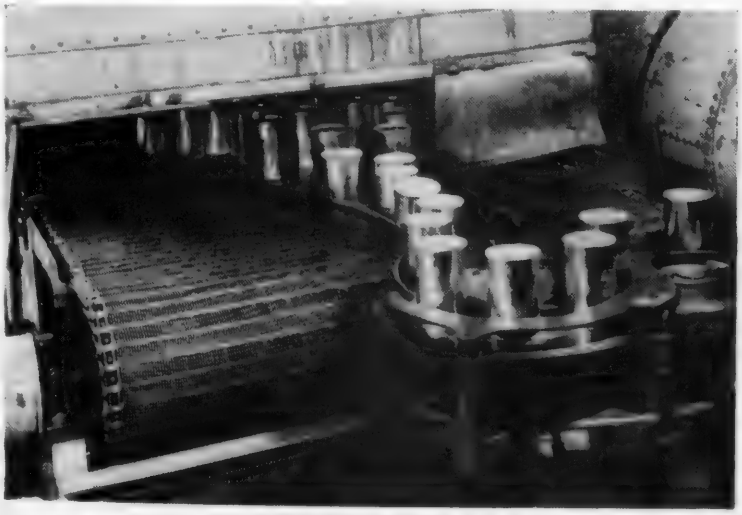
Conveyors for the Food Industry

To meet the demand for a light conveyor in the food industry to reduce manhandling, speed production, and increase output in existing premises, a range of conveyor equipment for the transportation of commodities varying in weight between a few ounces and 1 cwt. is being produced by Teleflex Products.

The standard conveyor is capable of maximum loads of 75 lb. per carrier; construction is light and flexible, and the units can be suspended easily and quickly without disrupting production during working hours.

Light loads up to 15 lb. at 12 in. centres can be carried over a length of 150 ft. by the Torsion conveyor, which is a compact and inexpensive unit.

Based on the Keen dual directional chain, floor and overhead conveyors have also been developed with a carrying capacity of 1 cwt. at 18 in. centres. In the case of this equipment 90° vertical bends can be supplied.



A woven wire conveyor belt in use on an exhauster in a food canning factory.

Wedge Wire Belting

Made in any length, endless if desired, and in varying widths and strengths, the woven wire conveyor belts manufactured by the British Wedge Wire Co. find applications in baking, canning, dehydration, freezing, inspecting, packing, and many other processes in food factories. The belts are made in a variety of types, including plain or rod reinforced chain link belts, spiral, twisted coil, wedge wire and wedge bar, and link plate belts; almost every belt can be either fitted with or attached to chains of different design.

In addition to woven wire belts, the company design and supply complete conveyors, elevators, portable loaders, stackers, and other mechanical handling equipment.

Obituary

We regret to announce the deaths of the following:

On August 10 Mr. W. H. French, secretary and a director of T. and C. Clark and Co. Mr. French had served with the firm for fifty-five years.

*

Mr. H. C. Price, manager of the Birmingham and district sales office of George Ellison.

Mr. Price was born in 1887 and was educated at Bedford School. He served his apprenticeship with the old British Westinghouse Co. (now Metropolitan Vickers Electrical Co.), with whom he remained until he joined the staff of George Ellison in 1919. Shortly after joining the company, Mr. Price opened their Birmingham and district sales office.

New Fruit Packing Station

A new fruit packing station, capable of dealing with 250,000 bushels of apples, pears, and other fruit in the course of a season, was opened at Colchester recently. The packing station, which has been built for Chelmsford and Colchester Packers, is one of the most up-to-date in existence, and provides facilities for both gas storage and the low temperature storage of quick frozen produce. There are sixteen gas storage chambers, eight with a capacity of 100 tons each and eight more with a capacity of 50 tons each.

The latest type of grading machinery has been installed, and mechanical conveyors handle the boxes as far as possible.

A new pack for quality apples and pears consists of a small cardboard tray with a transparent top, each fruit being provided with a nest of wood wool to prevent bruising. These "consumer packages" contain approximately 1 lb. of fruit. Eight packages fill a flat wooden display tray; these trays are wired together in fives to make a 40 lb. package for transport.

Retirements

Mr. R. K. White, general manager of George W. Horner and Co., recently retired after having completed forty-three years' service with the company.

At a dinner given in his honour Mr. G. Kenneth Horner, managing director, said that Mr. White was one of the assets taken over by his father, the late George W. Horner, when he purchased the business in 1906. During his years of invaluable service to the company, Mr. White had seen many changes, and had played no small part in the rapid growth of the company.

*

Mr. A. A. Pollock, B.Sc., director and chief mechanical engineer of The British Thomson-Houston Company, has retired. He will continue to act in a consultative capacity.

Mr. Pollock was born in 1882 and graduated at the Royal College of Science, Dublin; after practical engineering experience he joined the D.C. engineering department of BTH in 1902, becoming head of the department in 1910. In July, 1945, he was appointed chief mechanical engineer, and in March, 1946, was elected to the board of directors.

Mr. K. R. Hopkirk, M.A., has been appointed to succeed Mr. Pollock as chief mechanical engineer. Concurrently with this appointment, changes in the organisation and functions of some of the engineering departments have come into effect.

Plastic for Refrigerators

To provide an odourless, stable, and cold-resisting interior fabric for refrigerators and ice cream conservators, and for use wherever food is stored or served, the Plastics Division of Thomas De La Rue and Co. are manufacturing a special grade of their Delaron laminated plastic, in black or white in sheet sizes up to 9 ft. × 4 ft. in any required thickness. This lining is easily cleaned, and has negligible water absorption.

Refrigeration Export Drive

During the past year Mr. Hugh Edginton, Prestcold Refrigeration export sales manager, has travelled more than 100,000 miles by air in furthering Britain's export drive. He has visited North and South America, Africa, Australia, New Zealand, and Asia, and in each country he has found a keen demand for British-made products.

In anticipation of successful ratification of the Anglo-Argentine pact, Prestcold have succeeded in arranging exclusive representation by the leading sales organisations in Buenos Aires.

Design and Colour in Cartons

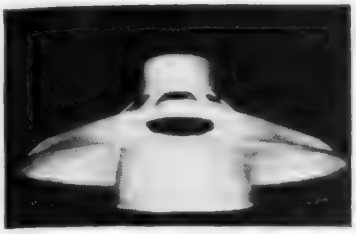
Manufacturers who use cartons for packing their products will be interested in the unusual shapes and designs for cartons produced by Boxfoldia. How effectively a simple design can be used for range designing is shown by their "Holly" brand cartons for packing pastry mixture, preserved ginger, and other lines, while their "Three Graces" carton for cereals and similar products shows an attractive two-colour design reproduced by photo-lithography. Another interesting design is that for a Christmas pudding carton which is based on seasonal appeal; its unusual shape makes it especially suitable for its particular purpose.

Industrial Truck Co. Acquired

Through their joint subsidiary company, Austin Crompton Parkinson Electric Vehicles, the Austin Motor Company and Crompton Parkinson have acquired control of I.T.D., sole world distributors of the petrol-driven range of British industrial fork lift trucks and ancillary materials-handling equipment marketed under the names "Stacatruc" and "Aerolift."

Mr. L. P. Lord, chairman and managing director of the Austin Motor Company, has been elected chairman; Col. R. T. Hartmann will continue as managing director of I.T.D.

It is the intention of the Group immediately to develop and expand the existing range of equipment, both for the home and overseas markets.



Redesigned Lighting Fitting

Suitable for diffused general illumination in small offices and corridors, and for general use, the Benflux lighting fitting has been redesigned.

The shade is now made in high efficiency urea-formaldehyde plastic and is of a more modern shape than the old glass shade. It is made without a lip and is retained in the Crysteel reflector by means of a three-legged spring attachment which is located inside the hole in the top of the shade.

The three-legged attachment is a separate part and is assembled to the reflector by means of the shade carrier ring or lampholder skirt.

A cut-off is provided with each size of fitting when using the largest recommended lamps.

The fitting is now being produced by Benjamin Electric in two sizes—12 in. for 40/60 W. lamps, and 14 in. for 100 W. and 150 W. lamps.

Hygienic Filling by Vacuum

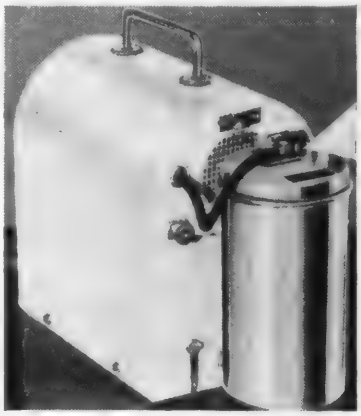
Widely used for handling a variety of liquid foods, including all types of sauces, vinegars, salad creams, fruit juices, and essences, the latest type of vacuum-operated filling machine made by Busby, Winter and Co. is a single-head model which can easily be mounted on a bench or table, a pliable hose permitting filling from any bulk containers.

Containers are filled to an exact height without risk of overfilling, and leaky containers are automatically rejected before being filled.

Different sized nozzles are available to fit various sizes of containers, and all nozzles are quickly interchangeable by hand. All metal parts in contact with the liquid are of stainless steel or Monel metal. Interceptors are of Pyrex heat-resisting glass, enabling liquids at high temperature to be handled with safety.

Double-purpose Pest Destroyer

During the past few years the need for control of insect pests and bacteria has been increasingly felt. Designed to deal with these pests in an efficient and inexpensive manner, the "Phantomyser," produced by Aerosols, has now been restyled so that it will produce either a dry aerosol, or, by changing the atomising tank, a fine spray. The dry mist of aerosols will not normally taint or discolour foodstuffs, etc., and effectively kills airborne insects, bacteria, and odours. By fitting another tank, which involves merely the turning of two screws, the "Phantomyser" becomes the "Spraydyser" and emits a fine



spray for the surface treatment of shelves, walls, floors, boxes, and sacks, to kill non-airborne insects, such as weevils, beetles, and larvae, and for the spraying of surface disinfectants.

The complete apparatus consists basically of the C.U. 1 compressor unit, to which can be fitted either the "Phantomyser" tank for producing the aerosol, or the "Spraydyser" tank for the fine spray.

Canned Haggis

Plans for the development of canned haggis have been temporarily halted while new canning plant is installed in the premises of a Glasgow firm of meat manufacturers interested in this work.

Haggis is regarded as having a considerable potential value in the export field, but the fat content of the haggis, prejudicing its keeping quality, is a difficulty to be faced. Canning of the product is a possible solution of this problem.

Cold Shoulders

While inspecting the Herring Industry Board quick freezing plant at Lerwick recently, Mr. J. J. Robertson, Joint Under Secretary of State for Scotland, discussed with the management the possibility of freezing mutton in the off-season. The mutton season could follow the herring season and give the plant an active life of about six months instead of three.

The Board might need special powers to handle food other than herring, but the expanded use of its quick freezing facilities would assist in solving its present economic problems. Although the suggestion is still in its preliminary stages it is understood that discussions will be initiated with the Ministry of Food and the Herring Industry Board.

Plastic Finish for Food Containers

Containers similar to their disc lid and screw cap containers but impregnated with plastic in place of the usual paraffin wax have recently been marketed by Mono Containers. The plastic finish renders the container more impervious to moisture and increases its holding properties, as well as giving it a high gloss and thus improving its sales appeal.

The company recently acquired the share capital of Perga, manufacturers of the paper milk carton. The carton, which is made in 10 oz. and 20 oz. sizes, has a folding top and is sealed by means of a metal strip. It is being used for packing confectionery, ready mixed foods, dripping, pre-cooked foods, frozen foods, cereals, powders, and fruit juices.

The plastic finish renders the containers more impervious to moisture.

Booklets Received

Their wide and varied range of products is presented in pictorial form in the newly issued catalogue *Musgrave Manufactures*. Among items mentioned in the publication are fans for all purposes, air conditioning, heating and ventilating equipment, dust removal plant, castings and fabricated plate work, and various types of driers.

▪

Manufacturers of goods and materials which have to be handled on an appreciable scale will be interested in a new edition of the electric truck catalogue issued by Ransomes, Sims and Jefferies. Elevating, crane, stevedoring, tiering, fork, and other trucks, as well as the standard pattern models with fixed and elevating platforms are detailed in the well-illustrated publication which concludes with a statement of the advantages of such transport and general remarks on battery charging, mileage per charge, and similar matters.

*

A method of applying a moisture-proof and/or adhesive coating to transparent film so that it will remain unaffected by immersion in hot or cold water is summarised in a recent issue of *Packaging Abstracts*. Among further British patents referred to in this issue is one relating to methods of sealing and reinforcing cartons with adhesive tape; others are concerned with apparatus for applying adhesive strip or labels to cans, a device for moistening adhesive surfaces on labels, and several other cartoning, packaging, or wrapping machines.

*

Specially designed in compact formation so that they may be included in self-contained refrigerated cabinets, the latest addition to their range of refrigerating equipment is described in a recent York Shipley brochure. Since a large proportion of their duties involve low temperature refrigeration, such as the storage of frosted foods and ice cream, these units have been specifically designed to give a high performance when handling low temperature refrigerants. Outstanding features include cushioned discharge valves, double trunk pistons, and a centriforce oiler.

OBITER DICTA

● Hunger is an international currency.—*Mr. Hector McNeil.*

● Industry makes money; science spends it.—*Prof. Paul Karrer.*

● Chemistry is an escape from a troubled world into a world where two and two always equal four.—*Dr. Foster Dee Snell.*

● A philosopher is one who instead of crying over spilt milk, consoles himself with the thought that it was four-fifths water anyway.—*Chicago Herald.*

● You must excuse my verbosity, for I happen to come from Australia, where, it is said, there are fewer people to the square mile than there are speeches to the square meal.—*Sir David Rivett.*

● If Mr. Strachey has cold feet we may send him a pair of fur-lined boots at Christmas, if the purchase tax comes off by then.—*Miss Maybel Grant, member of the Scottish Housewives' Association.*

● We have all gone crazy over milk, so that in the country as a whole, while little Willie gets his glass of milk, father does not get his beef or, at any rate, anything he can see.—*Mr. G. Lambert, M.P.*

● Every stall in Louth market is loaded with imported pears. There is such a glut that stallholders are endeavouring to sell at sixpence a pound.—*Telegram from Lincs F.U. to N.F.U. headquarters.*

● If we could save the damage wrought by rats, mice, and other pests we should have no need for Marshall Aid, and we should be well on the road to feeding ourselves and having everything we want.—*Mr. Richard Davies, divisional rodent officer.*

● When a man starts competing with nature he should be sure his formulae do not bear the skull and crossbones before he starts using them. We don't know what diseases these chemicals may cause.—*Dr. Paul Dunbar of America's Pure Food and Drug Administration on chemicals in synthetic foods.*

Designed to meet the new situation arising from combine harvesting, the Sturtevant pneumatic system of grain conveying, which is described in a new booklet *Grain Conveying and Bin Drying Plant*, is flexible and lends itself to any storage plants in existing buildings. The booklet contains various illustrations showing the layout of the plant, which comprises a high-pressure fan driven from a motor, engine, or tractor, with a continuous run of conveyor piping traversing all the feed and delivery points.

▪

Bee-keeping, ice cream manufacture, foundry practice, hot drink and food containers, oil and petrol strainers, and water distillation, are subjects featured in illustrated articles appearing in *Wiggin Nickel Alloys*, issued by Henry Wiggin and Co.

Company News

Despite the South African Government's embargo on the importation of such goods as sauces and pickles, the company had been able to show a trading profit only £2,500 below the record figure attained the previous year, it was stated by Mr. J. L. Deverell, the chairman, presiding at the fifty-second annual general meeting of Holbrooks. The problem of the slow return of casks by customers was becoming increasingly difficult and a solution had to be found if the vinegar trade of the company were to return to a satisfactory level.

The directors recommended a dividend of 11 per cent., less tax.

*

An out-turn of nearly 560,000 tons, in terms of white sugar, which was the highest yet achieved by the Corporation, was announced by the chairman, Lt.-Col. Sir Francis Humphrys, at the thirteenth annual ordinary general meeting of the British Sugar Corporation. In addition a very large quantity of stock feed was made available to the growers, and 174,000 tons of molasses were produced.

For the tenth year in succession the directors recommended the payment of a dividend of 4½ per cent., less tax, leaving £28,660 to be added to the carry-forward, which now slightly exceeded the highest figure attained in 1938.

World Food News

Polyglycol Esters

Esters of glycerol and many glycols and polyglycols are treated in a new brochure issued by Glyco Products. The uses of certain higher fatty acid esters in emulsifying agents, stabilisers, defoaming agents, surface-active agents, and plasticisers in many industrial fields are discussed. Special grades of edible surface-active agents and emulsifiers are also available for use in food products.

The polyglycol esters mentioned range from liquids of low freezing points to wax-like solids.

Canned Meat from Ireland

Notwithstanding the decision of the Dublin Meat Canners' Association not to resume production for the present, the quota of 10,000 tons of canned meat for Britain will be filled by city and provincial canners.

The members of the association have declined to restart production, mainly because of the price of 1s. 5½d. per lb. offered by Britain; the Association maintains that it would require between 1s. 10d. and 2s. per lb. to make production economic.

This season the output of canned meat will be supplemented by the production of a new canning factory at Clonmel.

Vegetable Sterols

Purified vegetable sterols are now available in tonnage quantities. Refined from soybean oil, the sterols, manufactured by Distillation Products, are fine white crystals with a minimum purity of 95 per cent. They are soluble in acetone, ethanol, and ethyl ether. They melt at 135°-138° C. and have a bromine number of approximately 500 g./kilo.

In the past, the high cost of animal sterols has discouraged much research into commercial processes which would utilise the reported ability of sterols to stabilise oil-in-water and water-in-oil emulsions and to serve as raw material for the synthesis of surface-active agents, pharmaceuticals, and other chemical products. Inexpensive vegetable sterols are expected to stimulate further research in these fields.

Fruit Freezing Experiments

That the rate of freezing fruits has no marked effect on the texture, colour, flavour, and vitamin content of the frozen product even after six months' storage is maintained by food scientists of the Geneva, New York, Experiment Station. Tests were made with strawberries, raspberries, and peaches. Similar results were obtained with vegetables in earlier tests at the station.

The experiments were made at a fast rate of freezing. Photomicrographs of thin sections of the frozen products were used to study the effect of the rate of freezing on the physical structure of the fruits.

Nigeria to send Oils to Britain

A contract for the supply of Nigerian oils and oil seeds to Britain for three years from January 1, 1950, was recently signed by the Ministry of Food and the Nigerian Produce Marketing Co. The agreement covers the entire exportable surplus of the Nigerian Groundnuts Marketing Board, the Nigerian Oil Farm Produce Marketing Board, and the Nigerian Cotton Marketing Board.

It is believed that supplies under the agreement will reach as much as 900,000 tons a year in terms of raw materials, equalling about 500,000 tons in oils and their equivalent.

Iranian Market for Food Machinery

OPPORTUNITIES FOR U.K. MANUFACTURERS

According to information furnished by the Counsellor (Commercial) to H.M. Embassy at Teheran, about 70 per cent. of the business placed for rice milling machinery by Iran has been obtained by the United Kingdom. It is estimated that there is a demand at present for about twenty small hullers and polishers (capable of dealing with ¼ ton an hour), worth a total of about £1,600, and for about six large machines (capable of dealing with one ton per hour), worth about £12,000. U.K. exporters have been able to obtain the majority of the orders so far, even though prices offered from the United States have been slightly lower and those from Czechoslovakia and Italy still lower, and though U.K. deliveries have been about eighteen months compared with ten months from other sources. There is no doubt that U.K. machinery has a high reputation in this field, but if this is to be maintained in the face of competition it will be necessary for suppliers to have active representation in Iran and to ensure that there is no lack of servicing arrangements and a full supply of spare parts readily available in the country.

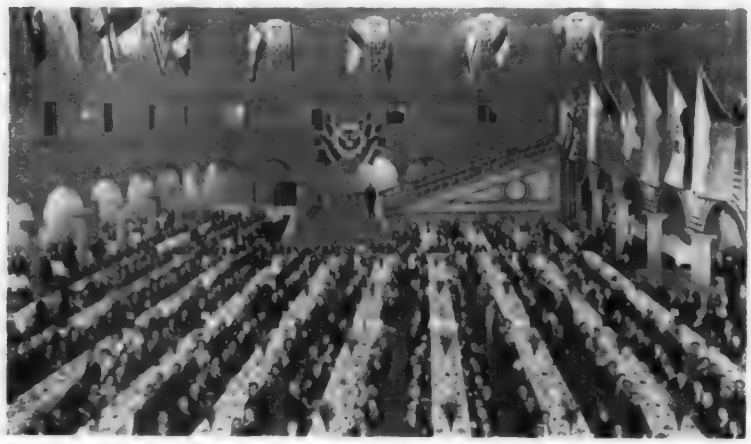
It is considered that there is a market for eight tea processing machines. Two U.K. firms are believed to be the only ones able to offer this type of machinery; no offers have so far been received from Germany. It is nevertheless generally suggested that, even in such circumstances, U.K. manufacturers should take special steps to ensure the provision of an adequate spare parts organisation and servicing arrangements.

One or two large flour-milling machines worth £10,000 each could probably be sold, but the main demand is for approximately twenty small machines for local use, the total value of these being about £20,000. Small portable mills are wanted, but it is believed that these have not yet been offered by U.K. manufacturers. One Italian-manufactured mill dealing with 300 kilos per hour has been mounted on a jeep and is driven from one farm to another by the owner in return for a sack of flour. It is considered that this type of machine is likely to gain rapid popularity and it would appear that U.K. firms who may wish to consider meeting this market demand will probably encounter Swedish, Czechoslovakian, or Italian production at lower prices.

The packaging of Iranian products is improving and there will be an increasing demand for packaging, canning, and labelling machinery. Products to be dealt with include fruit, tea, fish, caviar, and drugs and pharmaceuticals imported in bulk.

Dairy Scientists Meet in Sweden

SUCCESS OF TWELFTH INTERNATIONAL CONGRESS



Sixty-four tables were occupied by members at the banquet given by the Congress management.

Some 2,000 participants from 57 countries took part in the 12th International Dairy Congress held in Stockholm from August 15 to 19, during the course of which summaries of the papers submitted were presented and discussed.

The opening ceremony of the Congress was performed by H.R.H. Crown Prince Gustaf Adolf, who addressed the participants after Congress President B. von Stockenström's speech of welcome. Other addresses were given by Prof. Robert Burri of Switzerland, President of the International Dairy Federation, and by Prof. R. Mork of Norway, Vice-President of the Federation, who spoke on some social and economic aspects of the liquid milk market.

The same evening a reception for all Congress members was given by the Federation of Swedish Farmers' Associations and the Swedish Dairies Association in the City Hall.

The serious business of the Congress started on Tuesday, August 16, the procedure being that the general reporter of each subject read a summarised report of all the relevant papers in his section. Authors then had an opportunity of supplementing this report and the meetings were afterwards thrown open for discussion. Some idea of the magnitude of the ground covered will be understood when it is realised that during the different sessions all aspects of milk production and the manufacture of dairy products as they affect the producer, the distributor, the manufacturer, and the scientist were represented by some 400 papers from all over the world.

A pleasant interlude was enjoyed on Wednesday afternoon, when some 260 guests, at the invitation of the A.P.V.Co., partook in a trip by private steamer through the beautiful Stockholm Archipelago.

The Grand Hotel was the scene of a dinner given by the Minister of Agriculture on Wednesday evening to official delegates and general reporters of the Congress.

No less than sixty-four tables were occupied by members at the impressive banquet given by the Congress management in the City Hall on Thursday evening. A spectacular send-off to the proceedings was the sounding of a trumpet fanfare heralding a seemingly endless procession of immaculately coated waiters, tray in hand, who streamed down the main staircase to the hall below.

Throughout the Congress, afternoons were devoted to study trips to dairies and other establishments and to the showing of twenty films in Swedish and English versions dealing with dairy farming in different countries.

A plenary session took place on Friday, August 19, when the President of the Congress closed the proceedings.

Drought Affects Pineapples

South Africa's pineapple crop has been severely affected by the drought which has prevailed for some time. Pineapple production is largely confined to the eastern sector of the Cape Province, and inadequate supplies from that area have already created difficulties for the canning factories.

The pineapple plants are hardy, and should good rains fall soon the position will improve rapidly.

Polish Confectionery Industry

Factories under the administration of the Confectionery Industry Board in Poland fulfilled their three-year production plan on July 10, 1949.

The total output amounted to 28,940·7 tons of sweets and confectionery fancy goods of a total value of 110,661,000 Zlote (1937 prices), *i.e.* 101·5 per cent. of the target, and 4,946·8 tons of chocolate and cocoa valued at 24,740,000 Zlote (1937 prices), *i.e.* 114 per cent. of the target.

Packing Plant for Uruguay

Work is progressing satisfactorily on the construction of a new fruit and vegetable packing plant near Las Piedras, Uruguay; operations are expected to start by the end of this year.

The object of the plant is to provide the Uruguayan market with fruit and vegetables all the year round at reasonable prices, and for this purpose produce from the surrounding areas will be packed and preserved.

The plant is a six-storey building, located near the railway line and a highway, both of which are faced by platforms facilitating the rapid reception and despatch of merchandise. The plant covers 13,000 square metres, has refrigeration space of 40,000 cubic metres, will have storage capacity for 400,000 cases of fruit and vegetables, and will be able to handle over 1,000 tons of meat a month.

It will be equipped with the latest chilling and freezing equipment, special provision being made for the pre-cooling of fruit. Freon gas will be used in the cold chambers and the compressors in the engine-room will be of the centrifugal type.

Exposition of Popcorn

The First International Popcorn Industries Exposition organised by the National Association of Popcorn Manufacturers, Inc., is to be held at the Palmer House Hotel, Chicago, on October 24, 25, and 26.

Food Machinery for Honduras

An enquiry has been received by H.M. Consul-General at Tegucigalpa, Honduras, from Mr. Charles Mulvany, P.O. Box 80, Tegucigalpa, for machinery for the manufacture of corn flakes, a mill for producing corn meal, and equipment for the manufacture of corn starch. The projected installation will be on a small scale for local requirements.

U.K. manufacturers who are interested are invited to communicate direct with Mr. Mulvany, giving details of plant they can supply, together with prices and the approximate delivery periods.

An attractive pack has been designed for wine vinegars bottled by Spice Island's Company, California.

Storage Tanks for Breweries

The Vancouver Engineering Works, the leading general engineering firm in Vancouver who represent J. and E. Hall and other companies, would be interested to receive quotations from United Kingdom manufacturers for glass-lined storage tanks for breweries.

Any U.K. manufacturer who is interested should write direct to the Vancouver firm.

New Australian Food Projects

According to Mr. William Strutt, the U.K. Agricultural Adviser in Australia, new food projects may be established in Queensland by the British Food Corporation.

Mr. Strutt has just returned from a tour of the area where 30,000 acres have been sown with sorghum. Although severe frosts had damaged the yield, it should represent a considerable addition to the amount of coarse grain available for pig feeding in Britain.

News from the Ministries

Pears from Italy

The new season's pears are now arriving from Italy and examinations made by various Medical Officers of Health have shown that a relatively small proportion of the fruit still retains a slight trace of an antiparasitic spray.

The spray can easily be removed by wiping with a cloth, and the Health Authorities are carefully examining all the pears now arriving to ensure that this is done where necessary before the fruit is offered to the public.

The Italian commercial authorities have taken steps to prevent further consignments of affected fruit from being exported.

Whale Meat Products

The Meat Products and Canned Meat (Amendment No. 2) Order, 1949, provides that whale meat must not be mixed with other meat in any meat product. The reason for this restriction is as follows: products containing whale meat are exempt from price control; other meat products are subject to maximum prices, and the addition of even a small quantity of whale meat to these products would enable the maximum prices to be evaded.

The Ministry of Food recognises that whale meat, which in nutrients and vitamins is approximately equivalent to beef, is a valuable food. The restriction on its use in meat products has been imposed solely for the reason given above and does not conflict with the Ministry's desire to encourage the manufacture and sale of whale meat products.

Traders are reminded that if whale meat products are labelled or advertised in any way, the description used should indicate that the products contain whale meat.

Imports of Soft Cheese

Camembert, Pont l'Eveque, Carré de l'Est, Brie and Demisel cheese from France, and Camembert cheese from Denmark, will cease to be imported by the Ministry of Food when present contracts expire on October 31, 1949.

Ample supplies of these French and Danish products are available, and from November 6 their importation by private traders will be permitted under licences issued by the Board of Trade. Further details of the licensing arrangements will be announced later.

The Ministry intends to remove price control when private importation is resumed. Prices are not expected to rise.

The necessary amendments will be made to the Cheese (Control and Maximum Prices) Order.

Frozen Whole Egg

The Egg Products (Control and Maximum Prices) Order, 1946, has been further amended from September 11 so as to allow caterers and institutions already obtaining supplies of egg products from wholesalers to buy frozen whole eggs against their authorisations for egg products. Frozen whole egg, which is available in containers of 28 lb., and multiples of 28 lb., will be charged against authorisations on the basis of 4 lb. of frozen whole egg to 1 lb. of dried egg.

Imports of Hazelnut Kernels

Hazelnut kernels consigned from France, Spain, and Turkey can now be imported without individual licences being required.

Labelling of Foods

The Labelling of Foods Order, 1946, has been amended from August 20, 1949.

Under the amending Order:

1. Frozen processed peas will be subject to the same special labelling requirements as those already in force for canned processed peas.
2. Manufacturers will, for the present, continue to be exempt from the necessity of disclosing the ingredients of Christmas puddings, as they were when the Manufactured and Prepacked Foods (Control) Order, which was revoked on August 7, was in force.

Fish Distribution Offices

The Area Fish Distribution Office for the South-West Division of England at Bristol has been closed from September 8, 1949.

The work of the Bristol Office in inland fish distribution will be carried out at the office of the Divisional Food Officer, 34, Tyndalls Park Road, Bristol 8.

The supervision of allocations and other matters connected with fish distribution at the ports in the south-west are now dealt with by Mr. C. F. Gorringe (who has been in charge of the Bristol Office) at Paignton. His address is Ministry of Food, Food Office, Paignton, Devon.

Honey from Argentina

Arrangements have been made for the importation of a limited quantity of honey from Argentina under individual licence.

Applications for import licences in respect of firm offers should be made on the usual form ILD/A (in duplicate) obtainable from the Board of Trade, Import Licensing Department, 189, Regent Street, London, W.1, or from the Ministry of Food, Preserves Division, Import Section, Carlton Hotel, Pall Mall, London, S.W.1.

For administrative convenience applications when completed should be submitted to the Ministry of Food at the above address.

Appointment

Mr. F. A. Bishop has been appointed private secretary to the Minister of Food in succession to Mr. G. S. Bishop, O.B.E., who has been promoted to be an under-secretary in the Ministry.

Preserves Order Amended

The following amendments to the Preserves Order, 1947, have been made:

1. A small quantity of fruit curd is being imported by private traders for the first time since before the war. Under the Amending Order, it will be sold free of price control in the same way as imported jams and marmalades. Home-produced fruit curd remains subject to the maximum prices prescribed under the Preserves Order, 1949, as amended.
2. The maximum selling prices prescribed for imported honey under the Preserves Order, 1947, as amended, will also apply to honey imported from the Irish Republic, with the exception of honey in the honey comb which is free of price control.

Decontrol of Tapioca and Sago

The Tapioca and Sago (Maximum Prices) Order, 1947, has been revoked from August 16, 1949, so as to free these products from price and other controls imposed by the Order.

As ample supplies of tapioca and sago are now available abroad at competitive prices, it is expected that selling prices in this country will fall below those prescribed under the Tapioca and Sago (Maximum Prices) Order.

Pastry Mixture from Norway

A limited quantity of pastry mixture may be imported from Norway during 1949 under specific import licence.

Importers will be nominated by the Norwegian exporters; each nominated importer will be advised by the Ministry of Food as soon as the nomination list is received from the Norwegian authorities and will be told how to apply for the necessary import licence.

New Anglo-Brazilian Agreement

SCHEDULES OF TRADE IN 1949

As a result of discussions carried on in Rio de Janeiro between the representatives of His Majesty's Government and representatives of the Brazilian Government, notes were recently exchanged in Rio between the two Governments confirming agreement reached on schedules of trade in 1949.

The two Governments undertake, subject to agreement on price and quality and bearing in mind the basic principle of reasonable equilibrium in current sterling payments in both directions, to do all that is possible to grant the necessary export and import licences for the goods listed in the trade schedules.

The agreement relates to the year 1949, but will be automatically extended for a further three months unless either Government gives notice to the contrary by November 30, 1949.

The schedules of trade between the United Kingdom and Brazil during 1949 provide for U.K. exports to the value of £30,775,000 and imports (including rice for other Commonwealth countries) of £33,349,500. In addition, supplies of petroleum and petroleum products to Brazil are expected to be maintained at about 7½ million.

The programme of exports from the United Kingdom to Brazil includes coal, iron and steel manufactures, non-ferrous metal manufactures, chemicals, machinery, vehicles, and other consumer goods. The total estimated U.K. exports for 1949—£30,775,000—compare with exports of £26 million in 1948.

The proposed imports from Brazil include, *inter alia*, hides timber, coffee, cocoa, and some meat, sugar, oranges, and Brazil nuts, together with rice for British Commonwealth territories.

The general provisions and payment arrangements of the Anglo-Brazilian Trade and Payments Agreement signed on May 21, 1948, remain in force: these provided for the maintenance of a reasonable equilibrium in the current movement of sterling payments in both directions at the highest possible level, and the settlement in sterling of all trade and financial payments between Brazil and the Scheduled Territories.

Export Licensing Control

Among those goods which do not now require export licences are beverages (soft drinks), chicory, fruit juices, spices, vinegar, yeast, certain types of bladders, casings and sausage skins, and scrap and waste of compounded rubber.

Licences will in future be required for rabbit skins and hare skins.

Edible Pulses

The Pulse (Amendment) Order, 1949, has been made, further amending the Pulse (Control and Prices) Order, 1948, as follows:

Packeted Dried Peas.—Maximum prices are prescribed for handpicked threshed home-grown peas when sold prepacked in containers of not more than 1 lb. Previously separate prices have not been prescribed for packeted dried peas. These prices came into operation on August 14, and are as follows:

	Per cwt. net weight.
On a sale by a licensed peapicker to the NAAFI or to a person other than a retailer, a caterer, or a fish frier ..	96s. 4d.
On a sale by a licensed dealer to another licensed dealer ..	98s. 4d.
On a sale to a retailer or a fish frier ..	102s. 4d.
On a sale by retail ..	1s. 1d. per lb.

The provisions of the Labelling of Food Order, 1946, will apply to the sale of peas in prepacked form.

White Beans.—The Order also reduces the maximum prices of white beans (haricot type) by 1d. per lb., and of butter beans by 3d. per lb. at all stages of distribution. This reduction has been made possible by the fall in world prices this year. The revised prices for sales between licensed importers came into force on August 14 and in respect of other sales by wholesale on August 21, and for sales by retail on August 28. The new retail prices of white beans (haricots) will be 10d. per lb., instead of 11d. and of butter beans 10d. per lb. instead of 1s. 1d.

Yugoslav white beans are added to the list of specified pulse controlled by the Order.

Bread Wrapping and Slicing

RESTRICTIONS TO BE LIFTED

The restrictions on sales of sliced bread, machine-wrapped bread, or bread wrapped in specially prepared paper will be lifted on October 30, 1949. Because supplies of suitable wrapping material are still scarce, only limited supplies of prepacked bread will be available when the ban is lifted.

A retailer will be allowed to charge extra, at the rate of one farthing per 14 oz., for sliced or whole bread which is completely wrapped and sealed in waxed paper or cellulose film, provided he also has unwrapped bread for sale within the maximum price limit. No extra charge will be allowed for wrapping bread in ordinary paper at the time of sale, although on grounds of hygiene the Ministry recommends that bread should be so wrapped whenever possible.

The necessary amendments will be made later to the Bread (Control and Maximum Prices) Order.

Wrappers need not specify the description, weight, or ingredients of the contents or the name and address of the packers. If a wrapper or advertisement claims either directly or by implication that vitamins or minerals are present in the bread, a quantitative statement of the vitamin or mineral content must be shown in the manner prescribed in the Second Schedule to the Labelling of Food Order.

Care should be taken to ensure that wrappers do not contravene Regulation 1 of the Defence (Sale of Food) Regulations by falsely describing the bread or by making misleading statements about its nature, substance, or quality or its nutritional or dietary value. The Ministry will advise on this point if specimens of the wrappers are sent to Food Standards and Labelling Division, 47, Portman Square, London, W.1.

Slices of bread are not regarded as constituting loaves and they are, therefore, exempt from the restrictions applying to the weights of loaves.

The costs and proceeds of wrapping and slicing bread will not be taken into account for bread subsidy purposes.

Cereal Breakfast Foods Order

The Cereal Breakfast Foods (Control and Maximum Prices) Order, 1947, has been amended from August 21, 1949, to prescribe maximum prices for five new brands and three existing brands of cereal breakfast foods.

Citrus Fruit Juices

The Advisory Committee for the Control of Citrus Fruit Juices, which has been operating since January, 1942, to ensure the equitable distribution of supplies of citrus fruit juice, has informed the Ministry of Food that it has now completed its allocation for 1949 and that, as sufficient supplies of juices now appear to be assured, it considers the functions of the Control as an allocating body to be at an end. The Ministry agrees, and the Control is being ended. The Committee will, however, continue to be available for consultation by the Ministry on questions affecting citrus fruit juices.

Milk and Dairies Regulations

The following Regulations, which re-enact with amendments the Milk and Dairies Regulations, 1926 to 1948, and the Milk (Special Designations) Regulations, 1936 to 1948, come into force on October 1, 1949:

1. Milk and Dairies Regulations, 1949 (made jointly by the Minister of Health, the Minister of Agriculture and Fisheries, and the Minister of Food);
2. Milk (Special Designation) (Raw Milk) Regulations, 1949 (made jointly by the Minister of Health, the Minister of Agriculture and Fisheries, and the Minister of Food);
3. Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations, 1949 (made jointly by the Minister of Health and the Minister of Food).

The new Regulations give effect to provisions in the Food and Drugs (Milk and Dairies) Act, 1944, and the Milk (Special Designations) Act, 1949, in which the Government prescribes measures to improve the standard of purity of milk.

Manufactured and Prepacked Foods

REMOVAL OF LICENSING RESTRICTIONS

The Manufactured and Prepacked Foods (Control) Order, 1942, has been revoked from August 7, 1949. From that date, no licences are required for the manufacture and/or prepacking of the following foods and any other products not covered by existing Orders:

Bakers' prepared materials (except food substitutes), baking powder and bakers' cream powder, barley flakes, barley flour, botanical beers, breadcrumbs and fish dressings, bun flours, cake decorations, candy floss, carrageen moss, chocolate spreads, Christmas puddings, curry powders, dessert moulds, dried fruit (except dates prepacked under a registered trade mark or authorised mark), essences, extracts (meat, yeast, and vegetable), flavourings, flour mixtures (cakes and pudding mixtures and extruded products not covered by the Macaroni and Similar Products Order), food colourings, gelatine, gelatine products, gravy preparations and brownings, gravy salts, headings and foam liquids, herbs and roots, hop products, ice cream powders, stabilisers, etc. (except those containing more than 90 per cent. of cornflour), infant and invalid foods, isinglass, jellies (invalid), jellies (table), junket mixtures, malt extract, malt extract tablets, malt flour and malt meal, Maté tea, meat tenderisers, milk setting powders, popcorns and crunches, potato straws and savouries, preservatives, proprietary food beverages, pulses, rennet and whey, salad dressing powders, salt, seasonings and seasoning compounds, semolina (coloured and flavoured), shredded suet, soup powders and mixes, soya flour mixtures, spices, stuffings and forcemeats, toffee apples, vegetable and fish sausages and savouries, and vinegars (including artificial vinegar).

The removal of licensing restrictions does not mean that supplies of essential raw materials for manufacture are no longer scarce. Those ingredients which are subject to allocation by the Ministry will continue to be allocated.

Licences will still be needed to manufacture or prepack food substitutes as defined in the Food Substitutes (Control) Order, 1941.

New entrants to the food trades are reminded that labels on prepacked foods must comply with the Labelling of Food Order. Care should be taken to ensure that descriptions applied to manufactured and/or prepacked foods could not be held to contravene Regulation 1 of the Defence (Sale of Food) Regulations. The Ministry is prepared to advise on labels and descriptions, and any manufacturer or prepacker wishing to take advantage of this service should approach the Food Standards and Labelling Division, Ministry of Food, 47, Portman Square, London, W.1.

Table jellies have been subject to standards of composition prescribed in manufacturing licences issued under the Manufactured and Prepacked Foods (Control) Order. The Ministry intends to maintain these standards in an Order to be made under the Defence (Sale of Food) Regulations.

The Shredded Suet Order, 1949, has been made which continues the provisions of the Manufactured and Prepacked Foods (Control) Order so far as they relate to shredded suet. Existing licences to manufacture and prepack shredded suet will continue to have effect as though issued under the new Shredded Suet Order. There will be no alteration in the prices of shredded suet.

Feedingstuffs Order

The Feedingstuffs (Rationing) Order, 1949, which consolidates and re-enacts the Feedingstuffs (Rationing) Order, 1943, as amended, came into force on September 1, 1949. The principal changes are as follows:

1. Rye is derationed as an animal feedingstuff, together with its products and by-products. Supplies of home-grown rye are expected to be adequate for requirements for human consumption and it has therefore been decided to allow any remainder to be sold unrationed for animal feedingstuffs. Price control remains.

2. Alterations have been made to the schedule of rationed feedingstuffs. They include the following:

(*a*) entries relating to oats and barley have been redesignated to cover all oat and barley products and by-products (subject to fibre content);

(*b*) the entry relating to mixed feedingstuffs is reworded to make it clear that a mixture of rationed feedingstuffs and any other substances counts as a rationed feedingstuff under the Order;

(*c*) grain sorghums have been added, as limited supplies are expected from Queensland. The Feedingstuffs (Licensing and Control) Order, 1943, has been further amended accordingly.

3. A new provision is included which explicitly makes it an offence to be in possession of feedingstuffs that have not been obtained in accordance with the terms of the Order.

4. The ration documents and the feedingstuffs to which they relate are listed for the first time in a new schedule to the Order. The list includes a coupon and buying permit for a new compound, National Pig Starter Food, which is being introduced as part of the farrowing sow allowance.

5. A revised form of return is prescribed for the use of producers of wet and dried grains and various by-products of brewing, malting, and distilling. Separate returns will no longer be required from distributors of wet grains.

The Order is not applicable to Northern Ireland.

Nut Kernels

The Nut Kernels Order, 1947, has been amended to prohibit the sale and purchase of mixed nut kernels to avoid evasion of price control.

The title of the amending Order, which came into force on August 14, 1949, is the Nut Kernels (Amendment) Order, 1949.

Dried Figs

Under the Dried Fruits (Amendment) Order, 1949, which came into force on August 14, dried pressed figs prepacked in the country of origin will be able to be sold in this country free of price control. Traders are being allowed to import these figs for the first time since the war.

All dried figs were removed from the Points Rationing Scheme on May 22, 1949.

Information and Advice

Preservation of Red Currants in Casks

B.3556. *What is the procedure for preserving red currants in casks with the addition of sulphur dioxide?* (Canada.)

If the red currants are to be used for jelly they are put down in casks after the stemming operation and preserved by the use of sulphur dioxide. For each 100 lb. of fruit, 5½ oz. of potassium metabisulphite (P.M.S.) or 6½ lb. of 3 per cent. sulphur dioxide solution are required—*i.e.* sufficient to give a sulphur dioxide concentration of approximately 2,000 parts per million. About one-third of the sulphur dioxide solution is added first to the open topped cask. Then the currants are added with thorough stirring until the cask is half full. A further portion of sulphur dioxide solution is added at this point, then filling is continued with stirring. Finally, the remaining preservative solution is added. As there is a considerable chance of pockets developing, the practice is often followed with fruits of this consistency of filling the casks one-half to two-thirds full on the day of packing and covering temporarily with vapour-proof paper held tightly on top with a hoop. Next day the contents are combined to give full casks. In order to assist further the uniform distribution of the preservative throughout the contents it is good practice to roll the casks each day for several days after packing.

If, on the other hand, the red currants are to be used for jam, it is preferable to cask a hot pulp. The currants are pulped in a steam-jacketed pan with about 15 per cent. added water until all the fruits are broken and the pulp is smooth in texture. The pulp is cooled to 180° F. and filled into casks through two-inch side holes. The preservative solution is added at three stages during filling, as suggested above, and in the same proportions. When full the casks are bunged immediately and rolled to ensure uniform mixing of the preservative.

Ice Cream

B.3572. *Could you suggest an ice cream recipe, using sweetened baking cream in lieu of fat and sugar?* (Lancs.)

As no mention is made of the composition of the sweetened fat it is intended to use or of the other ingredients available, it is being assumed that the sweetened fat contains 30 per cent. fat and 70 per cent. sugar (a common ratio), and that an allocation of full cream milk powder (roller process) is available.

There is no reason why a reasonably good ice cream should not be produced without using any margarine and using only sufficient sugar to make up the full pre-war sweetness. This can be done by using formula (*a*) below.

On the other hand, it is logical to use sugar and full cream milk powder in the proportions in which they are allocated, but in this case the use of some margarine is necessary to give a good fat content. Formula (*b*) is on these lines.

Both formulae contain approximately 8 per cent. of fat, 13 per cent. sugar, and 34 per cent. solids. In (*a*) the milk-solids-not-fat content is 10 per cent.; in (*b*) it is 6¼ per cent., and is derived mostly from the lactose. In (*a*) the fat comes from the sweet fat (4½ per cent.) and from the milk powder (3½ per cent.); in (*b*) it comes from the sweetened fat (2½ per cent.); milk powder (¾ per cent.); and margarine (4¾ per cent.).

The following are the formulae:

	(*a*)	(*b*)
	lb.	*lb.*
Margarine	—	5¼
Full cream milk powder ...	14½	3
Sweetened fat	15	8½
Sugar	1½	4
Lactose	—	4
Soya flour	2½	4
Ice cream powder	—	4½
Glyceryl monostearate ...	½	½
Sodium alginate	¼	¼
	Gallons.	*Gallons.*
Water	6½	6½

Each batch makes 100 lb. of mix. Butter or cream essence, colouring, and flavour may be added as desired. The ice cream powder (hot process) can be replaced by an equal weight of custard powder or deglutenised flour. Processing is as follows:

Sufficient water is heated to 140° F. to allow 6 lb. of water to each 1 lb. of milk powder. The milk powder is sprinkled on top of the water and whisked until as much as possible of the powder has dissolved (it is not completely soluble). The sugar, lactose, and soya flour are then added, also the sodium alginate and ice cream powder (or custard powder or deglutenised flour) previously mixed with water. Finally, the remainder of water should be added (if any).

The margarine, sweet fat, and glyceryl monostearate are melted in a separate pan and poured into the remainder of the mix. In the case of formula (*a*) the whole of the mix is heated to 180° F. and held at that temperature for ten minutes; with formula (*b*) the whole should be heated to 200° F. for five minutes. Emulsification and/or homogenisation should take place while hot, followed by rapid cooling. The final operation is the addition of flavouring and freezing in the usual way.

Information Supplied

B.3593. *Suppliers of peanut butter.* (London.)

B.3594. *Manufacturers of almond blanching machines.* (London.)

B.3596. *Suppliers of machinery suitable for the manufacture of potato straws.* (Lancs.)

Information Required

B.3665. *Names of suppliers of Scheu Oil, an oxidised vegetable oil used as an emulsifying agent.* (Yorks.)

B.3693. *Name of present manufacturers of the "Regal" sausage filler.* (Liverpool.)

B.3715. *Names of firms willing to undertake the drying of cod flaps.* (Surrey.)

Recent Patents

622,928. NOTEVARP, O.: Method of producing fish meal.
622,939. HEINZ CO., LTD., H. J.: Apparatus for the sterilisation of canned foods.
623,011. SVENSKA JASTFABRIKS AKTIEBOLAGET, and ROSENQVIST, S. O.: Method of extracting or expelling water and other liquids from yeast suspensions.
623,223. BAKOVENBOUW VOORHEEN, H. P., DEN BOER, N.V.: Baking ovens.
623,270. BAKER PERKINS, LTD., ANCIENS ETABLISSEMENTS A. SAVY, JEANJEAN AND CO., and TUNLEY, A. A.: Cooling conveyors for moulded chocolate and like plant.

Abstract of a Recent Specification

Preparation of Green Vegetables for Canning

This invention relates to improvements in the canning of green vegetables such as peas, string beans, lima beans, asparagus, and spinach.

The primary object of the invention is not only to preserve the colour of green vegetables during canning, but to shorten the period of treatment so as to preserve the natural substance of the vegetable, to reduce expense, to improve penetration of the treating alkaline agent, and to make possible continuous rather than batch treatment where colour preservation is practised.

It has long been known in canning that the colour of a green vegetable can be preserved by adjusting the hydrogen-ion concentration and particularly by carrying on the pre-canning treatment in alkaline solutions.

To this end, it has been the practice to soak such products as peas for considerable periods in heavy alkaline solutions in order to neutralise any acidity and enable the vegetable to absorb substantial alkalinity before being blanched. In the course of soaking for the time required for penetration of the vegetable by the alkaline solution, the vegetable is quite apt to become softened to an objectionable degree, with the result that subsequent handling is made difficult and substantial impairment of quality occurs.

The invention constitutes a method of preparing a green vegetable for canning, which consists of blanching the vegetable, rapidly cooling to a temperature not exceeding 130° F., soaking the vegetable in an alkaline solution without substantial increase in temperature, placing such vegetable and a brine into a can, and, before sealing, adding a tablet containing a measured amount of alkaline material.

In fact, because the blanching precedes the soaking in alkaline solution, it is possible, without any appreciable impairment of colour, to reduce by approximately two-thirds the soaking time otherwise required, with the result that the vegetable is not appreciably softened in soaking. The blanching removes from the surface of the vegetables any mucilaginous substance in this material such as is naturally present (this applies particularly to peas), and drives off the air from the cells of the vegetable, opens the pores, and possibly otherwise prepares the vegetable to receive the alkaline reagents relied upon to preserve colour. The result is that the time required for treatment and the concentrations of alkaline agent heretofore required are both reduced, and continuous treatment becomes possible.

616,792. *Walter Lawrence Schroder and Edith Hoysradt Rogers.*

Recent patents have been selected from the "Official Journal of Patents" and are published by permission of the Controller of H.M.S.O.

Trade Marks

PHEASANT BRAND.—671,551. Preparations of chocolate for use in spreading on foodstuffs. **Naamlooze Venootschap Fabriek Van Melkproducten Der Vereenigde: Zuivelbereiders** (a Company incorporated under the laws of the Netherlands), 18, Persoonsdam, Rotterdam, Holland; Manufacturers of Dairy Produce.
C-CUBS.—671,647. Cocoa, chocolate, and non-medicated boiled sugar sweetmeats. **Cadbury Brothers, Limited,** Bournville, Birmingham; Manufacturers.
KING'S HEAD.—672,316. Confectionery (non-medicated). **Dunhills, (Pontefract), Limited,** The Licorice Works, Pontefract, Yorkshire; Manufacturing Confectioners.
SKIDDAW.—672,446. Non-medicated confectionery. **John Jowett,** 21, Pedder Street, Morecambe, Lancashire; Manufacturer.
DAILY.—672,890. Gravy browning, being a colouring matter for food. **R. Lehmann and Co., Limited,** Peninsular House, Monument Street, London, E.C.3; General Merchants.
SNAPJACKS. — 673,457. Biscuits (other than biscuits for animals). **Burton's Gold Medal Biscuits, Limited,** Quality House, Vicarage Road, Blackpool; Manufacturers.
SILHOUETTE.—673,586. Non-medicated confectionery. **Butter Candies (Treforest), Limited,** Main Avenue, Treforest Estate, near Pontypridd, Glamorganshire; Manufacturers.
CUBOX.—678,354. Beef extracts, being goods for export. **Bovril, Limited,** 148 to 166, Old Street, London, E.C.1; Manufacturers.

Trade marks have been selected from the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

New Companies

Quickfish, Limited. (466628.) 18, Essex Street, W.C.2. To carry on business of manufacturers of and dealers in frozen fish, fruit, foodstuffs, etc. Nom. cap.: £100 in £1 shares. Permt. dirs.: L. de S. Tufnell, 19, St. George's Court, Gloucester Road, S.W.; A. J. Perry, 33, Hadley Gardens, Chiswick, W.4.

Goodefayre (Walworth), Limited. (466816.) 257, Walworth Road, S.E.7. To carry on business of makers and bakers of and dealers in bread, pastry flour, confectionery, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: Hilary E. Ranch, 138/140, Broadway, Bexleyheath; Ethel M. Davis, 138, Canberra Road, Charlton, S.E.7.

Evington Food Products, Limited. (466855.) To carry on business of grocers, manufacturers of and dealers in potato crisps, etc. Nom. cap.: £3,000 in £1 shares. Dirs.: R. E. Cooper, Mill House, Mountsorrel; F. C. Dimblebee, The Red Lion Hotel, Rothley.

Fried Crisp Products, Limited. (466860.) To take over business of manufacturers of fried crisp products carried on as "Fried Crisp Products" at 43, Church Street, Caversham, Reading. Nom. cap.: £1,000 in £1 shares. Dirs.: J. F. E. Salter, Bent Mead, Waltham St. Lawrence, Berks; C. A. Kyme, 206, Caversham Road, Reading.

Moss Storage (Great Britain), Limited. (466890.) To acquire and operate a licence under certain letters patents granted or to be granted in the U.K. to Sapek S.A., Switzerland, to acquire interests in any patents relating to storage of food and other commodities, etc. Nom. cap.: £15,500 in 15,000 non-cum. pref. shares of £1 each and 10,000 ord. shares of 1s. each. Dirs. to be appointed by subs. Subs.: S. A. Hutchinson, 1, Crouch Hall Road, N.8 (clk.); W. G. Tisdale, Brendon, Station Road, Cookham, Berks. (clk.).

E. C. Farman, Limited. (467640.) To carry on business of manufacturers of and dealers in food and produce, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: to be appointed by subs. Subs.: E. C. Farman, 29, Aldford House, Park Lane, W.1 (co. dir.); A. Duchim, 5, Queen Anne Street, W.1 (solr.).

M. H. Guise, Limited. (467664.) 31A, Crouch Hill, N.4. To carry on business of fish merchants, etc. Nom. cap.: £500 in £1 shares. Dirs.: M. H. Guise, 111, Stroud Green Road, N.4; A. E. J. Smith, 1, Spring Cottage, Kenardington, near Ashford; G. H. McLeod, 121, Hornsey Lane, N.6.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C. 2.